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ORIGINAL COMMUNICATIONS.

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PRESENTATION OF CASES OF PLASTIC SURGERY.*

BY JOSEPH C. BECK, M. D., CHICAGO.

I desire to present to you a number of cases, the majority being still in progress of correction, believing that by showing them from time to time, you will appreciate more the difficulties associated with this line of work and that you will be more interested.

CLEFT PALATE AND HARE-LIP CASES.

Case 1. Child, 7 weeks old, born with a complete cleft-palate and hare-lip, (Figure 1). Under general (chloroform) anesthesia, I bored a hole through the hard palate by means of an awl and passed through a soft silver wire, No. 12. Pressing with my hands the two superior maxillae so as to approximate the cleft, I then brought the free ends of the wire across the external surface of the hard palate and united them in front in the middle line corresponding to the central incisor area. Here the wires were twisted and bent back into the now narrowed cleft, so as to keep the sharp ends out of the way of the lip and tongue of the baby. The lip was now loosened from each side of the superior maxilla, the edges were freshened on and united with a deep suture at the nostril so as to form in a corresponding shape to the normal one, opposite. Two more interrupted skin sutures were placed, the lip turned up and three fine sutures placed through the mucous membrane of the upper lip.

*Read at the meeting of the Chicago Laryngological and Otological Society, November 21, 1911.

This produced a marked change in the appearance of the child, (Figure 2). After one week the silver wire was removed, as well as the other stitches, and the result is very satisfactory, cosmetically as well as functionally, because the baby can nurse and gain strength so that the second step of the operation, namely uniting the hard and soft palate, may be undertaken.

Case 2. Baby, $3\frac{1}{2}$ years old, was born with a cleft-palate posteriorly including all the soft palate and some of the hard, but the cleft did not extend through the pre-maxilla. Under general anesthetic (chloroform) the margins of the cleft were thoroughly freshened on. The mucous membrane was also thoroughly loosened from the bony cleft. Counter-incisions were made close to the teeth so as to enable one to bring the margins together across the bony cleft. The uvula was first formed and then six to eight strong silk stitches were placed interruptedly and the cleft united. Recovery was uneventful and the union perfect. The child now receives instruction in speech to correct the rhinolalia pate.

Case 3. Miss B., 15 years old, was born with a cleft-palate of the pre-maxilla (unilateral) only, and hare-lip. When she was 5 weeks old, I operated upon her, uniting the hare-lip and bringing the hard palate in line. Subsequently, a year or more later, I refreshed these edges of the hard cleft and obtained a complete union. The nostril was, however, very large and out of shape. The patient consulted me again this summer. This time I loosened the ala from the apertura pyriforma by incising the mucous membrane of labio-gingival margin.

Case 4. Master T., 14 years old, complete cleft of hard and soft palates beginning just behind the teeth. Four unsuccessful attempts at union have been made. There is a great deal of scar-tissue present and the margins of the soft palate are very firm and resistant; the cleft is large. Under general anesthesia (chloroform) the margins of the cleft posteriorly were freshened on and thoroughly dissected. It was the intention to attempt to close only the posterior portions at this time. Taking a firm bite posteriorly through the flaps and employing chromosized cat-gut, two stitches were placed and buried, that is, the suture did not come all the way through into the mouth. Then I placed six silk sutures through the entire thickness of the flap, tying within the mouth. The location of the cat-gut stitches was avoided by the silk ones so as not to get too much tension at one point.

The result is but partial, the most posterior part remains united. Nevertheless, this is a great gain, in that it is a starting-point and

nourishment of the parts will be greater and heal better in the next attempt.

Case 5. Miss Eva, 29 years old. Immovable soft palate (congenital); rhinolalia pate. I presented this case to this society nine years ago and demonstrated the advantages of injecting hot paraffin submucously in the posterior wall of the pharynx at the level of the border of the soft palate in order to approximate these two parts and reduce the space; thus improving the speech defect. Since I discovered that the paraffin has a tendency to slide downwards, I lengthened the soft palate by making a transverse incision through its entire thickness and uniting it longitudinally. The result has been very gratifying in that it made considerable difference in the timber of her voice.

NASAL PLASTIC CASES.

Case 1. Mr. J., 26 years old. Unilateral destruction of the ala and facial scars following accident, burning by means of the third rail of the electric railroad upon which he fell. This patient was presented to this society last year before anything was done on the nose, (Figure 3).

Operation:—Margins of alar defect were thoroughly freshened. An incision was made through the skin covering a markedly projected deflected septum. Then this projected cartilage in the form of a crescent to fit the alar defect was brought over and both skin and cartilage were approximated and stitched with cat-gut. The skin covering the cartilage became continuous with the inner surface of the ala of the cartilage and served as support for the skin now to be transplanted from the vestibule and upper lip. This skin about the vestibule and upper lip was loosened up and stitched to the outer surface of the alar defect. This procedure closed the entire nostril for the time being. It was intended to sever the parts in the median line of the columella as soon as union took place. This, however, did not happen and the whole thing became infected, most probably due to the closure of the nostril, and the first operation was a failure.

Second attempt two weeks later: A flap about three inches long and two inches wide was made on the fore-arm, the pedicle being directed upwards. This was kept from reuniting by interpassing a layer of gauze and gutta-percha and allowing it to shrink and get firm. After about two months the alar defect was again freshened and this pedicle flap from the fore-arm sutured into it by placing about eight stitches. A plaster cast was put on to keep the parts immobilized, (Figure 4). After twelve days the cast was removed

and the flap was found united on one small place, not sufficient to keep it alive were it severed from the fore-arm. Consequently it was again separated from the ala and the operation was again a failure. After the parts all healed, in about three or four weeks, the same procedure was repeated. On the third night the patient had a nightmare and tore the flap loose from the ala. This made the third intervention a failure. One month later the same procedure was performed; this time, however, the patient sat up, making it much easier for him as well as for the operator, especially in regard to placing the plaster Paris cast. All the operations on this patient were performed under local Schleich infiltration anesthesia.



Figure 4. Italian method (plaster-cast retention).

After fourteen days of retention in the cast, it was found that union of the arm-flap had taken place. It was now severed at the pedicle and allowed to remain loosely attached for forty-eight hours, so as to be absolutely sure that it would live. The flap was now pared down and trimmed to make an ala. Part of the skin was turned in, so as to have a dermal layer lining the ala, and then stitched through in the form of a quilt-stitch tied over gauze. Union was primary and a good patent nostril, although stenotic, was present. This in a measure was due to the presence of the deflected septum.

One month later a resection of the projecting cartilage, and sub-mucous resection was performed, with good results, making the

breathing-space much better. The cosmetic result is very good also, (Figure 5).

Case 2. Mr. T. had chancre nine years ago, followed by the tertiary lesion with marked destruction of the entire septum and lateral masses of the nose causing a falling in particularly of the anterior portion.

After a thoroughly anti-luetic treatment by Dr. B. Shurly, of Detroit, who kindly referred the case to me, (Figure 6), the following procedure was carried out. Under general anesthetic (chloroform vapor), the columella was severed from its attachment from the upper lip. The alae were cut away from the cheek at the crease and the nose turned upwards, (Figure 7).

Dissecting freely the tissues attached to the apertura pyriformae and forcibly retracting, the superior maxillae were exposed. With a chisel two osteo-periosteal flaps, one on each side, with their base downwards, were made from the apertura (superior maxilla) and turned towards the median line where they were united by cat-gut suture of the periosteum. This formed a transverse septum to support the nose, (Figure 8).

The nose was turned down again and sutured, (Figure 9). Union was prompt and the result very satisfactory. The transverse septum united and can be easily demonstrated. After six months the shrinking was considerable and the nose was not much better, the alae especially appeared small and collapsed. It was then decided that there was too little soft tissue present to make further correction; so a transplantation operation was decided upon. Similar procedure was carried out as in case 1, in preparing a flap from the fore-arm. After the flap had a good body the patient was anesthetized (chloroform vapor) and a transverse incision was made across the nose from one side to the other at the lower margin of the nasal bones. The nose was now carefully, but freely, dissected and pulled down, great care being taken not to destroy the newly-formed transverse septum. Bringing the flap from the fore-arm up it was sutured into the upper margin of the created nasal defect and the parts put in a plaster cast. After two weeks the cast was removed and the flap was found to be united. It was now severed from its attachment to the fore-arm and to the lower margin of the created defect in the nose. A large window was left in the plaster cast exposing the patient's face for dressing the wound as well as for the functions. These casts are very uncomfortable to the patient, but they gladly put up with the inconvenience. The flap healed on very well, leaving plenty of skin to go on

with further external correction. One very striking fact about this patient is the splendid healing notwithstanding the fact that the Wassermann test on two different occasions was markedly positive.

Case 3. Mr. G., 29 years old. Congenital absence of the anterior triangular cartilage of the septum causing a marked, broad, flat tip of the nose.

Operation. Under local (Schleich) anesthesia, the columella was severed from the upper lip and the pocket created between the two layers of the muco-perichondrium up to the bony septum. An incision was made over the eighth rib about three inches long and a piece of rib about one inch long removed, properly shaped and placed in the above-mentioned created pocket and the columella again sutured to the lip. Tampones were inserted into the nostrils to obtain better and quicker union to the bone. Two days later the



Figure 10.
Rhino-hypertrophia (side view).



Figure 11.
Rhino-hypertrophia (front view).

stitches were removed. The result is very satisfactory. It is now almost a year and the bone is as large as ever.

Case 4. This is a case of hypertrophic nose, also known as rhinophyma. The operation for reduction of the mass was performed under local anesthesia, dissecting the nose and making use of skin flaps from the vicinity; also stimulating the wound to granulation with the aid of scarlet-red. The photographs (Figures 10 and 11), show the lateral and front views of the neoplasm; the stereoscopic view (Figure 12), shows the patient after recovery.

OTO-PLASTIC CASES.

Case 1. Miss G., 12 years old, had a chronic suppuration of the middle-ear cholesteatoma which was operated upon during her child-

hood by a simple operation; it continued discharging by a retro-auricular fistula, with a large scarred skin surface at this point. I performed a radical mastoid operation, excising all the scarred skin and brought the margins together by tension incisions in the scalp, but union did not take place and a large retro-auricular opening remained, (Figure 13). The suppuration of the ear, however, was cured.

Operation:—Under general ether anesthesia the margins of the opening were freshened and thoroughly dissected anteriorly over the posterior surface of the auricle as well as posterior over the occipital. Two small flaps made up of the newly-formed epidermal scars surrounding the fistula and going into the cavity of the everted mastoid were prepared and united by two cat-gut sutures to form a better base for the union of the skin flap externally. A curvilinear incision, about $1\frac{1}{2}$ -inch long with its convexity directed towards the torcular, was made one inch from the margin of the fistula. This incision went clear to the bone. With a periosteotome this whole flap was elevated and drawn over to the auricle. The margins of this fistula were now united by three silk sutures. The defect in the scalp was covered with gauze and allowed to granulate. Union was prompt and the fistula healed. (Figure 14).

Case 2. Mr. M., 61 years old, has had an epithelioma of the auricle for the past six months which involved more than two-thirds of the pinna.

Operation:—Complete excision of the epithelioma. Formation of a flap back of the ear in the form of a crescent, the outer margin of the flap going well into the hairy portion of the scalp. The pedicle of the flap is towards the neck and is broad. This flap was slid over and united with the remaining upper one-third of the auricle. The defect created by the flap was allowed to granulate. The union was prompt and the patient is ready for the second step of the operation, namely the loosening up of this flap from the mastoid region and the making of a flap downward which will be turned so as to make the posterior surface of the auricle.

Case 3. Mr. M. V., 70 years old. The same pathological condition existed as in the above-mentioned case, only the epithelioma involved the entire external auditory canal, middle-ear, and part of the mastoid. The removal was very radical, involving the lower and anterior portion of the tip of the mastoid, including the stylo-mastoid region. As a consequence, the facial nerve was irreparably wounded. The case is presented before any operation has been performed. The intention is to do much the same as in case 2,

only in addition I will attempt to find the peripheral end of the facial nerve and make an end to end anastomosis with the hypoglossal.

NEURO-PLASTY.

The next patient is a case of neuro-plasty for the cure of facial paralysis. Mr. C., 42 years old, has had chronic suppuration of the middle-ear ever since he can remember. Several times he has had severe dizzy spells. The last one was very severe, in fact, he became very ill and a physician was called who diagnosed his case as acute ptomain poisoning. He had very severe headache on his right side and by morning his face was paralyzed. Examination showed that he had an acute exacerbation of a chronic suppuration of the middle-ear with labyrinthian involvement. There was no reaction to the vestibular apparatus and when a "Laermapparat" was placed to his left ear he could not hear at all. He had a temperature of 103.5° F.; general condition poor.

Operation:—Cholesteatoma in mastoid with marked destruction of the region of the facial ridge and the horizontal semi-circular canal. On enlarging a fistula in this canal, pus escaped. Thorough eradication of all diseased processes, opening fully the horizontal canal, passing a probe towards the oval window and opening it up; thereby removing granulation-tissue. At the same time I uncapped the promontory of the cochlea. I left the ridge which contains the facial nerve, but the destruction was so marked there, that I did not believe the nerve could be saved. The patient made an uneventful recovery from this complete operation and the ear is entirely epidermalized at this time. Three and a half months later I decided to perform a plastic for the cure of the facial paralysis.

Operation:—Under general anesthesia I united the central position of the spinal accessory nerve with the peripheral end of the facial and the descendens hypoglossi branch with the peripheral end of the spinal accessory nerve.

This operation was exceedingly difficult owing to the many scars present from the mastoid disease and operation, but the patient had an uneventful recovery. It is now five and one-half months since this last operation and I present him because he now begins to show symptoms of regeneration of the facial nerve. It can be observed that when the patient is instructed to move the lip or close his eyes he cannot do so unless he moves the shoulder at the same time. In a very short time he will move his face every time he moves his shoulder, which is the objection against the spinal accessory facial anastomosis, but this he will later discontinue and

Stereoscopic views to illustrate Dr. Beck's article.

Cut on ruled line and mount on regulation size stereo-card, obtain able at stationer's or photo-supply house. (Size of card $3\frac{1}{2} \times 7$ inches).



Figure 1. Hare-lip and cleft-palate complete.

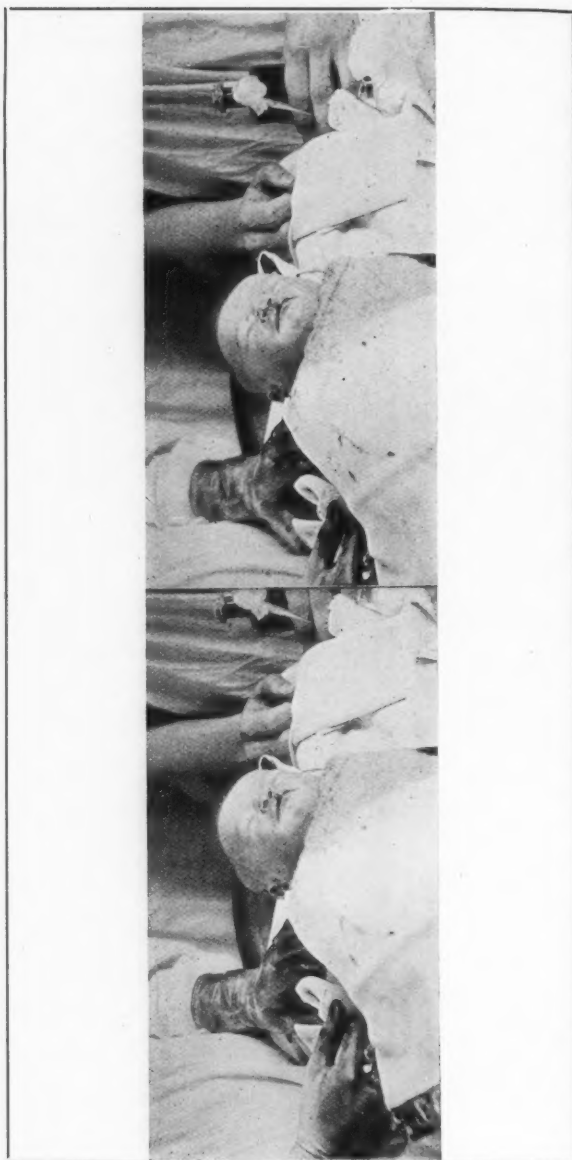


Figure 2. Repaired hare-lip and anterior part of cleft-palate.

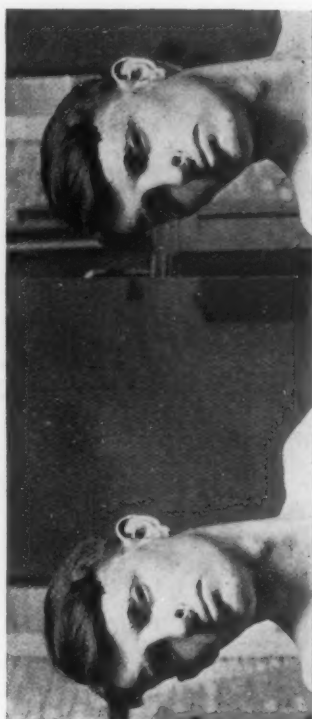


Figure 3. Alar Defect.

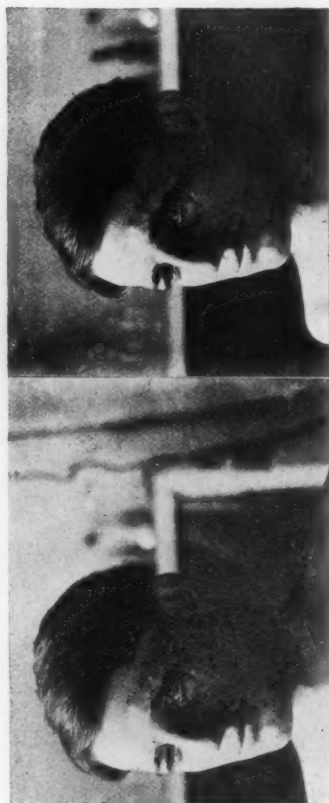


Figure 5. Alar defect repaired.

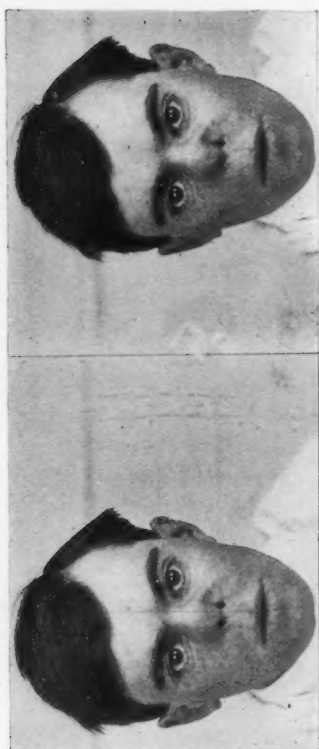


Figure 6. Collapsed nose—absence of septum.

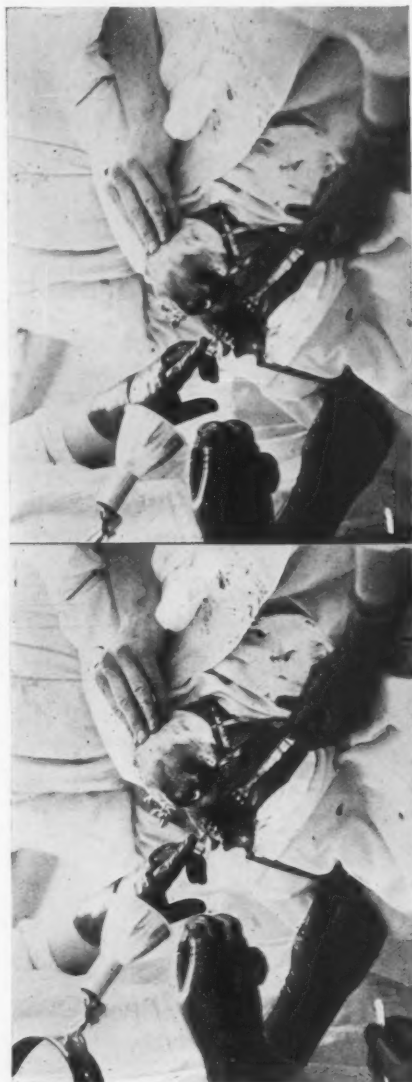


Figure 7. Elevation of the soft parts.

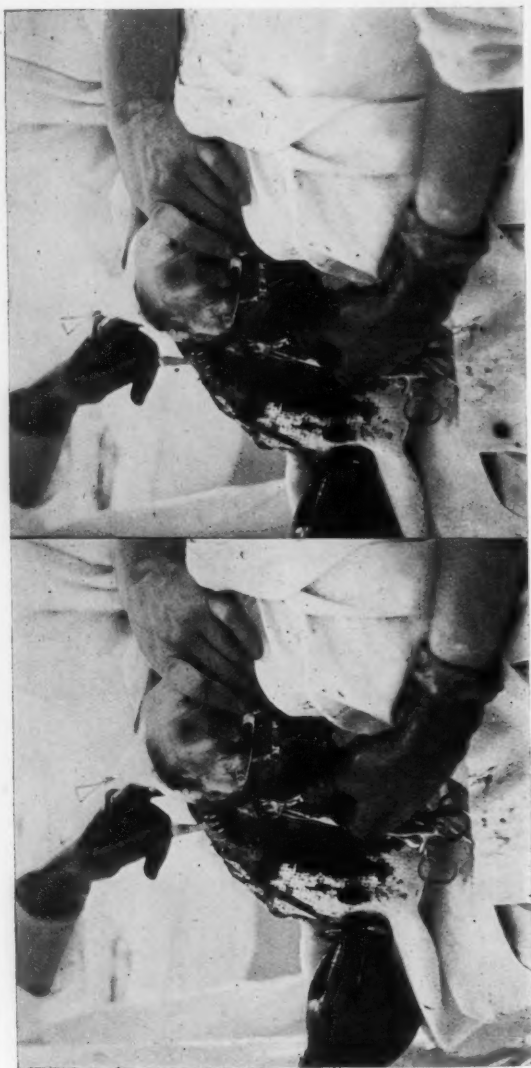


Figure 8. Formation of the septum.

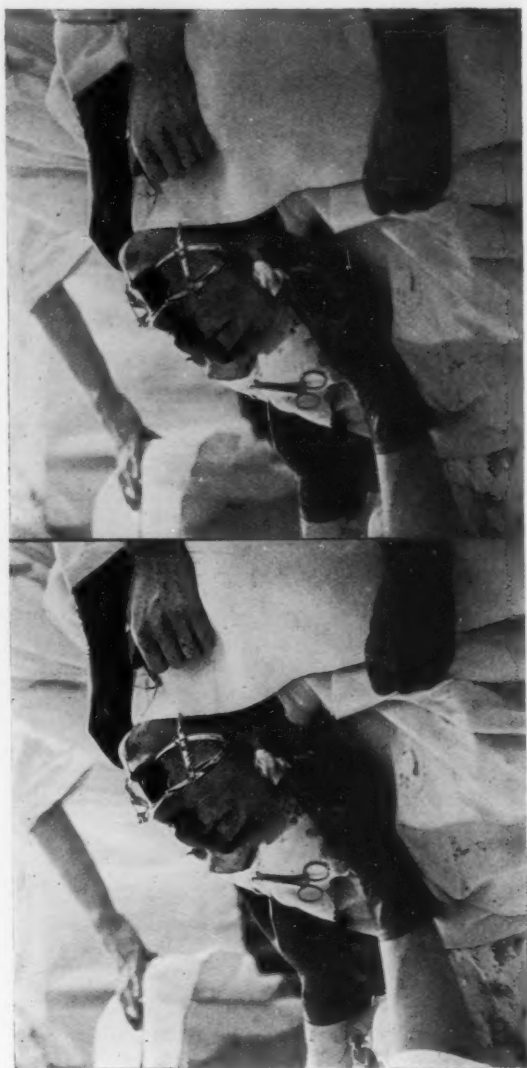


Figure 9. Reapposition of soft palate.

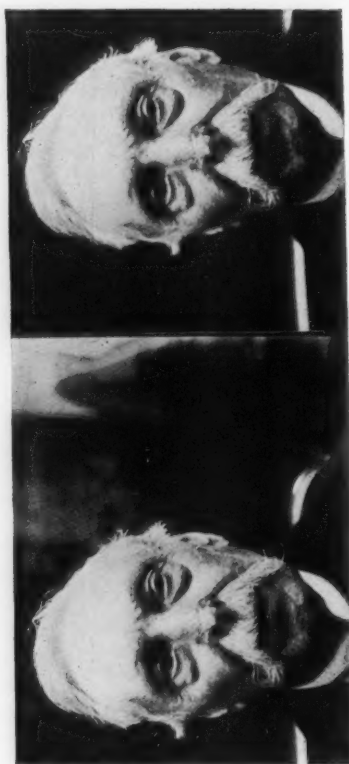


Figure 12. Rhino-hypertrophla after operation.



Figure 13. Persistent retro-auricular fistula.



Figure 14. Repaired retro-auricular fistula.



Figure 15. Persistent laryngo-tracheal fistula.



Figure 16. Closed laryngo-tracheal fistula by laryngostomy.



Figure 17. Epithelioma of the malar region.

he will be able to move the face without the shoulder movements. Again, he has lost none of the functions of the shoulder which is the result of the union of the descendens hypoglossi with the peripheral end of the spinal accessory nerve.

LARYNGO-TRACHEAL PLASTIC CASE.

Mr. H. G., 37 years old. About seven years ago he had some acute process in his larynx which demanded tracheotomy. After a period of two or three weeks, the physicians attempted to remove the tube but the patient could not breathe and the tube had to be re-inserted and every time after that when an attempt was made to withhold the tube the patient had great difficulty in breathing as soon as the external opening narrowed. He finally became resigned to wearing the tube permanently, until two years ago, when he applied at my clinic for the possible removal of the tube even if he lost his voice entirely by the procedure, (Figure 15). Examination showed a smooth mass on either side of the cords, in fact, the ventricular bands appeared very much thickened and the movements of the larynx were very much restricted. Attempts to pass intubation tubes or wearing of Roberts tube proved impossible, the patient was so irritable and coughed constantly. I therefore decided on an operation.

Operation. Laryngo-fissure. A bilateral tumor of smooth surface sprang from each side of the arythenoid cartilages. These growths, the size of the end of a thumb, were removed and the treatment continued as in any other laryngostomy by means of a Jackson up- and down-tube. After six weeks' wear of this tube, the entire surface being healed, I left it out and closed the opening by adhesive plasters (several layers) and found that the patient could breath without any difficulty. I therefore decided to close the external opening. Operation under local infiltration and instillation anesthesia. I made two semi-lunar flaps with their convexity outwards and dissected them loose, close up to the opening, but not going through. The margins of the opening served as hinges of pedicles of the flaps. Over the region of the thyroid cartilage, a portion of this fibrous cartilage was allowed to remain attached to these flaps to give them more body and make a more solid closure of the opening. These two flaps were now turned inwards the trachea with their dermal layer and united in the middle line. The skin on the side of the neck was loosened and united over this defect, just closed. Primary union took place and the patient remained healed, (Figure 16). The voice, of course, is

very bad, but is constantly improving. There does not appear to be any movement of the arythenoids. The histological examination of the tumors is adenoma with marked hypertrophy of the mucous membrane, entirely non-malignant.

EPITHELIOMA OF THE SIDE OF THE FACE, INVOLVING THE DEEPER STRUCTURES.

Mr. J., 51 years old, has had an ulcer on the side of the face over the cheek-bone for some time. It has been burned from time to time with no result except that it seems to progress. Examination shows a destruction of the malar bone in part and also of a portion of the zygoma. Histological examination of a portion removed demonstrates typical epithelioma. Radical operation decided upon.

Operation under chloroform anesthesia. The ulcer was excised and the epithelioma was found to involve the greater portion of the outer wall of the orbit, which was removed. The parotid gland, part of the coronoid process of the lower jaw, together with parts of the masseter muscles, the remaining portion of the zygoma, and malar bone were all removed. It was fortunate that the antrum did not have to be opened, but healthy base was reached before then. This large defect was allowed to granulate, also giving the patient a few x-ray treatments to be sure that all neoplasm was destroyed and to prevent recurrence. About two months later, when the surfaces looked healthy, I made a large flap from his shoulder, and by freshening the borders of the facial defect, I brought the side of his face towards the shoulder and sutured the flap on three sides. I then placed the head and shoulder in an immobilizing plaster cast for union. Unfortunately, this patient was a subject of recurrent erysipelas, and developed an attack. It was, therefore, necessary to take the cast down and separate the flap. This flap was dressed so as not to unite in its old position by the interposition of gauze gutta-percha. It is now three months since this complication set in, and the patient is ready for the second attempt. The shoulder-flap has in the meantime become firmer and will unite much easier and can be separated from its pedicle attachment much sooner, since it has its own independent circulation established, (Figure 17).

2551 North Clark Street.

A CASE OF OTOSCLEROSIS, WITH PATHOLOGY.

BY ALFRED M. AMADON, M. D., BOSTON, MASS.

The temporal bones which furnish the material for this paper are from a patient who died at the age of 84. The family history of the patient, which, with data concerning the patient himself, was kindly sent to me by Dr. J. Orne Green, shows an interesting transmission of deafness in three generations as follows: First generation, mother deaf; second generation, two sons and three daughters, all very deaf; third generation, twenty-two children who reached adult life and only two deaf; fourth generation, all young yet, none deaf.

The patient was distinctly gouty or "rheumatic" and had suffered severely from "rheumatic iritis," for which at one time an operation was considered, but not performed. In the autopsy protocol the anatomical diagnosis is: "general arteriosclerosis, marked arteriosclerosis of the left coronary artery, chronic myocarditis, slight hypertrophy and dilatation of the heart, primary carcinoma of the prostate, secondary carcinoma of the lungs, atrophy of the brain with compensatory edema of the pia, atrophy of the thyroid, leiomyoma of the stomach."

The temporal bones were placed in formalin and later put into the writer's hands by Dr. Clarence J. Blake for examination.

The unusual weight of the bones is at once noticeable upon taking them into one's hand. To approximate their density their specific gravity was determined and compared with that of a temporal bone of the average type taken from the cadaver and cut as nearly as possible like the specimen. The specific gravity of the pathological bone was 1.38 and that of the average specimen was 1.22, the ratio of the two being approximately 1:1 $\frac{1}{8}$. Upon section through the antrum and tympanum the spongiosa was everywhere seen to be very dense. (Figure 1). The antrum is of about average size, but the external auditory canals show a marked narrowing in their antero-posterior dimension, apparently due to the heavy development of the mastoid and the os tympani.

The drum membrane shows a crescentic thickening in its anterior and inferior areas. The outer ossicles are normal and without ankyloses in their articulations. The stapes is firmly held in a deep and narrow niche of the oval window.

The smooth contour of the promontory is broken by a rough bony excrescence which extends from the anterior portion of the lower border of the niche of the oval window downwards and backwards to the upper rim of the pelvis of the round window. (Figures 1 and 2). In the right ear the hyperostosis can be traced inwards along the floor of the niche of the oval window nearly to the annular ligament. At its most prominent part it presents sharp ridges and considerable depressions. The mucous membrane covering these hyperostoses is somewhat thickened in its deeper layers. That of the rest of the middle-ear is normal.

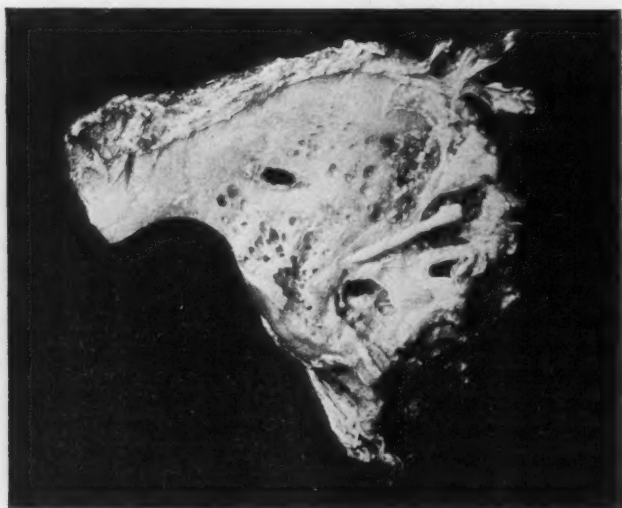


Figure 1.—Left temporal bone, cut through antrum and tympanum, showing the dense spongiosa, the fixed stapes and the rough promontory contour.

The right temporal bone was sectioned in the horizontal plane. There are no changes in the structure of the stapes. A nodular hyperostosis surrounds the anterior two-thirds of the oval window. Upon its vestibular aspect its upper border corresponds very closely to the course of the ramus superior of the nervus vestibulo-ampullaris. Below the oval window it involves the floor of the pelvis ovalis, raising the level of that surface until the crus posterior of the stapes is in contact with the floor of the pelvis. The extent of the hyperostosis is outlined in its lower part very closely by the excrescences noted upon the promontory.

The nodular mass has mounded into the vestibule and thrown itself about the anterior end of the footplate of the stapes so as to thrust that end strongly outward (Figure 3), the posterior end being correspondingly thrust inward (Figure 4). The cartilaginous lining of the fenestra ovalis is destroyed anteriorly and the surface of the new bone-formation is in contact with the cartilage of the foot-plate of the stapes. There are no other foci of new growth of bone in the capsule of the labyrinth, the structure of which shows



Figure 2.—Ridge of new bone-formation upon the anterior part of the promontory in the left tympanum.

rather large interglobular cartilage masses, but nothing pathological.

There are no pathological changes in any part of the membranous labyrinth and the eighth nerve with all its ganglia is normal, displaying in its trunk a few corpora amylacea.

Histologically the new bone-formation, called by Siebenmann¹ "neospingiosa," shows an irregular nodular structure with clearly cut marrow spaces irregularly distributed in the massive bone which

here and there displays a rather indefinite lamellar structure. The marrow spaces contain connective tissue having small, elongated connective tissue-cells and fine fibrils. In many are delicate blood-vessels. The bone-cells are small. The new bone and the normal capsular bone show a clear unconformity, to borrow a geological term, at their contact. Stained with hematoxylin and eosin the new bone holds the eosin better than the normal capsular bone but not so well as the normal spongy bone. Nowhere is there any active invasion of the capsular bone nor any zone of intermediate structure, but the two types lie against each other, each displaying its own histological peculiarities up to the line of contact.

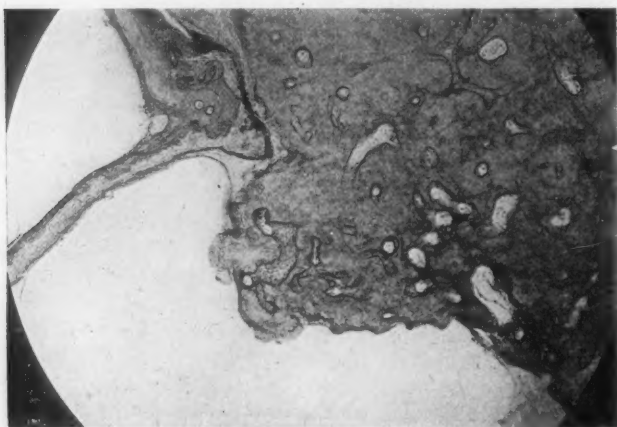


Figure 3.—Section through the anterior end of the footplate of the stapes showing the mounding of the neo-spongiosa into the vestibule and the thrusting outward of the stapes.

The hyperostoses upon the promontory and in the niche of the oval window display the same histological characteristics as above described. The submucosa of these areas, however, is somewhat more dense than that of the normal middle-ear.

These pathological findings confirm the diagnosis of otosclerosis, it being of the simple type, with stapes fixation and unaccompanied by degeneration of the eighth nerve or contents of the ductus cochlearis. It is evident that the process has been inactive for some time.

The subject of otosclerosis has been so completely reviewed by the works of Denker,² Heiman³ and Froeschels,⁴ and so ably discussed by other recent writers that any extended comment in this place is

uncalled for. The case here reported, however, suggests a few reflections that may be of some interest.

How far an inherited disposition to otosclerosis can be counted upon is an important problem. It is the kind of disease in which one would expect heredity to play a strong rôle. Consequently it is of interest to note the considerable variation in the statistics and the decrease in the reported frequency of the hereditary element as time goes on and observations increase. Amongst the most authoritative writers may be mentioned Bezold, who reported 52 per cent of

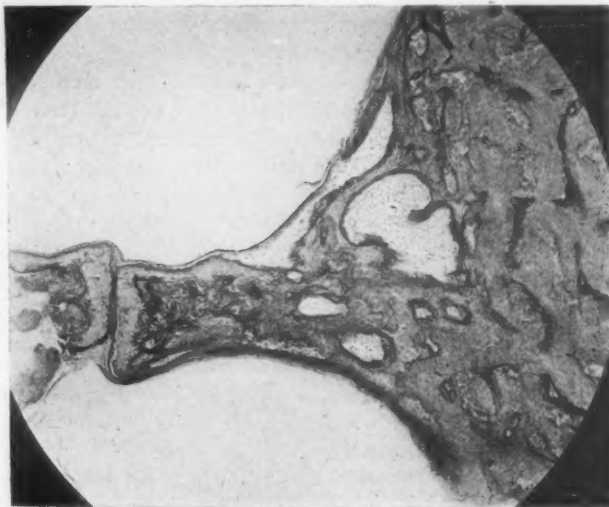


Figure 4.—Section through the posterior end of the footplate of the stapes showing the jamming of the stapes against the rim of the fenestra and its inward displacement.

otosclerosis cases as showing heredity, Denker with 40.5 per cent, Lucae with 37 per cent, and Siebenmann with 35 per cent. Heiman has found but 9 per cent to show a clear history of heredity. The writer, in a much smaller series of cases, has found it in slightly over 20 per cent. It is possible that, in his care to include only such cases as furnish a strong presumptive evidence that a deafness occurring in the family of a patient was from otosclerosis, he has cast out some that should have been included in this category. Such, however, would be an error upon the right side.

In his communication concerning the patient, Dr. Green pertinently wrote, "The family history, as showing the gradual disap-

pearance of the tendency toward otosclerosis in the succeeding generations, is interesting." The element of heredity is more completely defined in this case than in any other that has come under the writer's observation. One other, a gentleman of 70, stated that his mother and all her five brothers were very deaf from their youth, and that he was one of a family of seven, all but one of whom were similarly deaf. Of his four children who grew up to adult life, none are deaf. The writer has been unable to find any complete data concerning the collateral branches of this family, but he has found no deafness in the last generation. One is justified in a strong belief that this gentleman's grandmother suffered from otosclerosis.

In these two instances it is noticeable that there is a marked falling off in the tendency towards inheritance after two and three generations. The writer has never known otosclerosis to skip a generation from the time of its first appearance to its disappearance in a given family. The strength of the tendency to transmit this disease and the rapidity with which that tendency dies out are subjects for further investigation.

Because the origin of otosclerosis is so obscure one examines closely all data presented in the records of the disease in an effort to obtain some clue to its etiology. The results of such study have reached no finality, but the determination of the pathological processes that produce the neospongiosa and the frequency of the association in the same patient of otosclerosis with other affections of similar obscurity are suggestive.

It is noticeable that otosclerosis is very often associated, as in this case, with such affections as anemias, or arteriosclerosis, or some of the arthritides, whose etiology is not clearly understood. It happens so frequently that one expects to find it in his questioning of a patient. It is quite as much to be expected as is the evidence of heredity. A comparison of the pathology of some of these affections furthers the suggestiveness of this association.

Otto Meyer⁵ has lately described in detail the processes by which the bone of the labyrinthine capsule is replaced by the hyperostosis of otosclerosis. In the same article he pronounces upon the close similarity of this process to that described by Recklinghausen under the name of *ostitis fibrosa*. A like comment might be made with regard to the process described by Dr. Nichols and Dr. Richardson⁶ in their scholarly paper on *arthritis deformans*. A summary of the essential features of one of these processes would apply very closely to the others. Originating in the marrow spaces by the formation of

a proliferating connective tissue (Keimgewebe) that invades lacunae and Haversian canals, the affection, by a process of resorption, reduces the compact bone to a framework of trabeculae upon which the hyperostotic new growth is laid down. Although the capsule of the labyrinth possesses a unique histology, the structure resulting from the above outlined process presents a histological picture that is remarkably like that of arthritis deformans. From the fundamental character of this similarity of both process and results, the suggestion is strong that the diseases are at least so akin that when one of them has been resolved into its ultimate etiological factors the way to the solution of the problems of the others will have been pointed out.

It is difficult to refrain from a bit of speculation suggested by the pathology of otosclerosis. The disease is evidently one of locally disturbed nutrition. For some unknown reason it produces an abnormal development of bone in the capsule of the labyrinth, which is bone of a unique structure. A disturbance of the nourishment by an alteration of the blood-supply determines the new growth. This must come about by a change in the vessels from which the nourishment is obtained; whether by alteration in the vessel walls or from some affection of the nervous mechanism that regulates nutrition, the writer offers no opinion.

But in considering why the capsule of the labyrinth should be chosen as the site of such changes a theory presents itself. In an early article on otosclerosis, Dr. Siebenmann,⁷ whose insight is apt to be deep and clear, suggested that otosclerosis acted upon the bone of an infantile type and urged it onward into the development of bone of an adult type. This idea suggested itself to him because of the presence of the cartilaginous interglobular spaces that are the unique feature of the capsule and which are not found in the neospongiosa. Dr. Siebenmann's suggestion did not commend itself, one reason being that the new formation is not normal bone but a pathological growth.

Nevertheless, the notion Dr. Siebenmann suggested has long seemed to the writer to hint at the reason why the capsule of the labyrinth is capable of such a transformation and is the chosen site of it. The presence of cartilage in the texture of bone does suggest immaturity. Indeed, the infant comes into the world with a labyrinthine capsule nearly as well developed as it ever is. No bony structure in the body undergoes so little change during the course of a life-time as does the capsule, and it never gets rid of the vestiges of the embryonic cartilage in which its bone is laid down. Thus the

bone is immature. Young tissue, both as regards age and type, is very sensitive to nutritive disturbances. The pathological processes of arthritis deformans choose for their site a part of the bone in which nutritional processes are most active and the bone most capable of over-nourishment;—the part, also, that most recently underwent the transformation from infantile to mature structure.

Certain other features of the contents of the labyrinthine capsule contribute to this suggestion; the histological characteristics of the eighth nerve and of the cells of the ganglion spirale, and notably the peculiar susceptibility of the cochlear branch of the eighth nerve of pathological changes, as indicated by the various researches of Wittmaack.⁸ In connection with this last item one remembers that foci of otosclerosis are found in various parts of the capsule anterior to and including the niche of the oval window.

These facts seem to the writer to warrant the theory that otosclerotic processes select the bone of the labyrinthine capsule for the field of their operation because of its peculiar anatomical and histological characteristics. That otosclerosis is to be considered a disease that is in a class by itself because of some special etiology and pathology is a theory that does not commend itself. The capsule of the labyrinth, in the writer's opinion, takes its place along with those other parts of the bony skeleton that are, for anatomical or physiological reasons, peculiarly liable to pathological changes as the result of some more or less general condition, like a disturbance of nutrition. That the resulting metaplasia presents unique features is not due to any specific and local exciting cause but to a unique normal histology.

Or, considering the pathological process from the standpoint of injury and repair, the injury,—the lacunar resorption,—occurs to the bone of the capsule because, by reason of its infantile type of structure, it is peculiarly responsive to any alteration in its nutrient blood-supply or to any material change in the amount of that supply. The repair is accomplished in conformity with other processes of repair in osseous tissue so that the resulting structure,—the neo-spongiosa—presents an histological picture which is strikingly like that presented by processes, such as arthritis deformans, in other parts of the bony skeleton.

In the case here reported the activity of the pathological process has ceased and there is no actual ankylosis. The anterior two-thirds of the annular ligament—the portion that is of the greatest functional value—is largely destroyed. There is contact between the cartilage of the foot-plate and the encroaching neo-spongiosa,

and by the outward thrust of that end of the foot-plate and the jamming of the stapes in the oval window it is rendered functionless.

The patient was very deaf, but he might have been worse. That some cases of otosclerosis are for some reason checked in their onward progress and halt at a point short of extreme deafness is sometimes observed. The question arises whether it will ever be possible to produce this halting by treatment. What is a rational attitude toward the disease?

At present the prognosis, as far as any treatment is concerned, is hopeless. The writer has never had the pleasure of observing any beneficial result whatever in a case of pure otosclerosis from any of the measures, so often suggested in the literature, that he has tried, nor has he ever seen any patient that has been helped. The occasional reports from enthusiastic otologists of the good results from the use of some drug or other arouse either a doubt of the diagnosis, which, indeed, cannot always be absolutely certain, or a suspicion of careless or biased observation.

Of course, any reduction of the altered bone is out of the question. If, however, the progress of the disease can be checked before there is any ankylosis or break in the continuity of the annular ligament, or even if, as in this case, the process can be made to stop short of affection of the cochlear structures, as much will have been accomplished as is physically possible. With an earnest hope that some means to accomplish this end is amongst the therapeutic possibilities, a conservative and conscientious effort toward the discovery of that means is all that such a pathology will warrant.

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PHYSIOLOGY OF THE COCHLEA.*

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The physiology of the cochlea is rich in problems. If the function of the cochlea is based on physical laws, it is possible to work out its mechanical principles, and reproduce a working model of the cochlea.

The cochlea is purely a receptive organ. It is not a tone-producer, in this way resembling the graphophone rather than the phonograph. It receives sounds within certain limits of pitch and intensity. It receives vibratory pressures, and the larynx by command of the will, or by reflex action reproduces them. A person who has never heard sound cannot reproduce it intelligently, and cannot talk or sing except by special training. Reflexly, like the lower animals, he may make sounds expressing fright, pain, pleasure, or surprise. The male and female of each species giving utterance to high and low sounds, at least, hears a range of such sounds, otherwise his utterances would be of no vital or practical use to him. This statement applies to most mammals, birds and reptiles, with the exception of fishes. The highest screams made by children, according to McKendrick and Gray, is about 6,000 v. s., yet they hear tones as high as 40,000 v. s. Sounds are sometimes made independent of hearing, for example, the vibrations of a bee's wings produce the tone C when the wings make 256 vibrations a second, but this is no reason that the bee hears his own buzz. These sounds are not utterances; the rapid movement of the wings is made to support the body-weight in air. In other words, the bee buzzes in flying.

Do fish hear? This question may be solved by answering another question; do fish utter sounds? Does the whale utter sound? If so, he must receive sound by way of the cochlea. Do dancing mice utter sounds? I have never heard them and I would therefore conclude that they are deaf-mutes. In general the law is, that creatures receiving sound, make use of it by intelligent reproduction, and if creatures do not produce sound by the larynx or some special organ they do not hear sounds.

Whatever the mechanism of the cochlea be, it is reasonable to infer that it must register the physical properties of sound. This is shown by the following experiment. Take two tuning-forks of 256

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v. s. and change one of the forks so that the pitch will differ slightly. Set both forks in vibration and hold both to the right ear. The beats are clearly heard. This is purely a physical phenomena, the cochlea registers the beats, the left cochlea does not record the beats. Now set each fork in vibration and hold one fork to the right ear and one to the left. The beats are again heard, clearly, as before, but in the latter case, the physical property of each fork is registered by each organ of Corti to be blended or fused by the brain. In the first case a fusion takes place in the world without, while in the latter case the fusion takes place in the brain, provided each cochlea register 256 v. s.

The physical properties of sound are pitch, determined by the number of vibrations per second; intensity, determined by the amplitude of the wave, the higher the wave the louder the sound theoretically; and lastly the color-tone called timbre, quality, or character of tone, which depends on the form of the wave. These properties produce stimuli which cause sensation at the terminal hair-cells on the organ of Corti.

Sound is the result of variation in pressure, these differences in pressure cause vibration of an elastic body such as air. When these vibrations are regular we call them tones, but when irregular, noises. The organ of hearing is a receptive organ for the multitude of tones varying in quality, pitch, and intensity, and the varying noises in the immediate world about us. These sounds are heard if of sufficient intensity and within the limits of 40 to 40,000 single vibrations a second. The cochlea does not reproduce these sounds but the energy that the sound possesses causes pressure stimuli; a feeling, received by the sensory hairs of the organ of Corti which produces a sensation, which in turn is carried along the nerve fibers to the brain and there perceived. The cochlea contains an incompressible apparatus as the wax roll of the graphophone receives the pressures of sound. This impression is not sound, it is the result of sound, and can be reproduced only by a motor apparatus.

To best transmit sound from the air to a liquid, a middle-ear apparatus is necessary. The middle-ear apparatus is like a pendulum in equilibrium, ready to impart vibratory pressures from the outer world to the perilymph. I have tried to show how this equilibrium is maintained by the intrinsic middle-ear muscles in a physiological manner, in a former paper read before the American Laryngological, Rhinological, and Otological Society, at Chicago, February, 1909. These vibratory pressures could not be registered

if it were not for the fact that the perilymph is capable of mobility. The mobility of the perilymph is equal to the limits of excursion of its vestibular and cochlear membranes. Vibratory pressures are transmitted and not conducted from the membrana tympani to the vestibular membrane by the ossicles. Articulations of the ossicles still further prevent conduction. Transmission implies the possibility of molar movement while conduction implies the possibility of molecular movement. Molar movement of vibratory pressures is limited between 40 and 40,000 v. s. per second. Outside these limits we do not feel vibrations by way of the cochlea. The limited excursion of the vestibular membrane may limit the lower vibratory pressures, while lack of physical delicacy may limit the higher vibratory pressures. If there be no excursion of the vestibular window, as in complete ankylosis of the stapes, there is no mobility of the perilymph, and if there be no mobility of the perilymph an individual is totally deaf. Ankylosis is a relative term in otology. It may be partial or complete. If there be any hearing, there is some mobility. In any hindrance to the normal movement of the stapes the coarsest and finest movement naturally suffer most, hence the lowest and highest tones are not heard. It is well established that occlusion of the niche to the round window and ankylosis of the stapes causes total deafness. Mobility of the cochlea-fluid may be possible through the aqueductus cochleae or saccus endolymphaticus, but this seems doubtful. Where there is hindered mobility as in oto-sclerosis, patients claim to hear better when riding in a car or when in a noisy place. This is probably not true but only apparent, for on a train we naturally raise our voices in talking, and we generally sit close to the deaf person with whom we converse. We must speak loud enough to hear our own voice, or we cannot expect to make our traveling companion hear in a noise, even if he has normal hearing. The voice to be heard must be of greater intensity than the noise unless there is considerable difference in pitch. Such persons who have hindered excursion of the stapes, and hence lessened mobility, hear better when the sound received is intense, whether in a quiet room or in a noisy place.

The whale presents an interesting study. If the whale has complete ankylosis of the stapes, he must be deaf to sound when he comes to the surface of the ocean, while he may have a limited motion of the stapes at great depths, allowing some mobility.

It is necessary to admit that the function of the cochlea is hearing. No cochlea, no hearing. Fishes have no cochlea and there-

fore do not hear. In the development of the cochlea there is at first a budding out from the oto-cyst, a lagena as seen in reptiles and birds, and later, higher in the animal series this slightly curved portion develops into a true cochlea. Birds and reptiles with limited outgrowth of this special organ probably have a limited sense of hearing, and judging from the high sounds birds and reptiles make we expect only a development of the beginning of the cochlear whorl. It is reasonable to think that the greater the number of turns of the cochlea the greater the field of hearing.

Granting that mobility of the cochlea-fluid is necessary for sound-transmission, it is essential to consider some anatomical facts of the cochlea and apply the laws of physics. The cochlear duct is, roughly speaking, a triangularly shaped receiver which tapers like many of the wind-instruments; this receiver of sound first receives its energy from the end of smallest dimensions and is similar to the flute. The nearer the source of motive power the higher the pitch, the further removed the lower the pitch. Two sides of this triangular shaped tube are composed of membranes, while the third side is a part of the spiral ligament, which serves for the attachment of the basement membrane. Reissner's membrane, the membraneous side toward the scala vestibuli, is the simplest membrane, and is very delicate, capable of transmitting vibratory pressures from the perilymph to the endolymph within the triangular tube. The thicker and more dense a membrane, the less its power of shock-transmission from one fluid to another. If this triangular duct had walls of thick, or even thin bone lacking flexibility, the fluid within its walls would not receive slight vibratory shocks, and any pressures or impulses started up from movements of the stapes in the oval window would keep a course along the scala vestibuli through the helicotrema to the scala tympani and cause movements of the round window membrane corresponding to movements of the oval window, and therefore would not transmit shocks to the endolymph. Since Reissner's membrane is not tense or thick, but very delicate, vibratory shocks are readily transmitted to the fluid within the cochlea duct, where they cause the tectorial membrane to vibrate and thus stimulate the auditory hairs. The sound impulses do not necessarily pass by way of the helicotrema, but may take a short cut through the basement-membrane to the scala tympani. The basement membrane is much thicker and weighted by the organ of Corti. This membrane is attached to the lower border of the osseous spiral lamina, supports the organ of Corti and curves sharply upward at a point beginning with the

attachment of the scala tympani portion of the spiral ligament, and ends near the vas prominens. Of what use is this triangular bi-membraneous tube within a tube? If the basement-membrane is important, so is Reissner's membrane, for it forms the bi-membraneous mute flute. This mute flute is affected by the tones received in the same manner as if the tube itself were the producer of tone, and is therefore naturally selective of vibratory pressures, the high-pitched tones affecting the end nearest their entrance, and the low-pitched tones affecting the end farthest from the source. Thus the vibratory pressures received cause a sympathetic vibration of the fluid within the tube, and this is imparted to the sensory hairs in that region of sympathetic response, producing a sensation. The number of tones or noises received is unlimited within the limits of hearing. Noises may be considered as a definite, fixed jumble of tones. For example, if a new machine were invented, it would make a characteristic noise, which we should associate with that machine, just as we know the whirl of the flying machine, the chug or hum of the automobile, the noise of the mowing machine and numerous other machines, and thus all noises have a definite physical character or tone-color. Between 256 and 512 v. s., over 1000 different tones may be distinguished according to Ebbinghaus. Possibly in all 385,000 tones may be differentiated or as many sensory hairs as there are found in Corti's organ. Differences of tone are harder to distinguish, the nearer we approach the high or the low limits of hearing. The cochlear duct is, therefore, a reversal of the flute. The flute or flute-organ pipe is a producer of tone, the cochlear duct a receiver of tones. In the same sense a graphophone is a reversal of the phonograph. If sensation of pitch can be accounted for mechanically by a flute theory, intensity is but an increased stimulus, and the combination of pitch and intensity will account for color-tone.

The advantage of such a theory over the piano-theory of Helmholtz is that we can account for an unlimited number of tones within the limits of hearing. We are not confined to a given number of fibres. Then again, the vibration is received within the closed tube containing the auditory hairs which are the natural sensory terminals of the cochlear nerve. These hairs must be irritated and not the fibres of v. Hensen in the basement-membrane, which are not directly connected with the nerve-endings and thus further present mechanical difficulties. Islands of hearing may be accounted for by a flute theory, for we are considering the vibration of a column of

fluid and not the fibres in a basement-membrane, weighted and further complicated with blood-vessels and longitudinal fibres.

Still further delving into speculative otology, each anatomical peculiarity of the structure of the cochlea must have a reason for existence. Take, for example, the spiral arrangement of the cochlea. It would seem as if all sound must travel with a spiral movement to produce such a winding staircase. The old experiment of the wire-spring represents how sound travels in a to and fro manner without propulsion of the individual molecules of air. If sound does not travel with a spiral movement, how could sound develop the cochlea; and if not sound, what other energy could cause the development of the cochlea in a spiral course? The higher the pitch of the sound the closer the spirals come together and the nearer the sound spiral approaches a solid straight line in any direction. Is this the reason why high tones are more penetrating? The lower the pitch of the sound the further apart are the spirals; the diameter of the spiral would represent the intensity. Sound is, therefore, a spiral vibratory pressure.

It is a question if we should make fun of the men in Aristotle's time who believed that the high-pitched sounds traveled faster than the low-pitched sounds. Experiments in the velocity of sound vary greatly in air and liquid due to the variations in heat, air-currents and imperfectly recording instruments. Let us imagine that the difference between the velocity of the highest audible tone and the lowest audible tone is one foot a second, in other words a tone of 40,000 v. s. traveled 1101 feet a second and a tone of 40 v. s. traveled 1100 feet a second, the tones between these extremes traveling in proportional velocities according to their pitch. Now, the length of the cochlear duct (one and two-fifths inches in the human cochlea) with its sensory hairs may have some relation to the difference in velocity of sound from the highest to the lowest. Although we cannot estimate or comprehend time to minute fractions of a second, the series of hair-cells may be able to make such physical records. The rods of Corti with the basement-membrane form the tunnel of Corti which is like the wedge-piece of an organ-pipe. This wedge-shaped column of fluid separates an inner single row of sensory hair-cells from three, four, or five rows of outer sensory hair-cells. The purpose of this arrangement is not yet accounted for in the peripheral analysis of sound. The arrangement of hairs in the sensory hair-cells in straight rows and horse-shoe arrangement is probably not arbitrary but of a physical necessity. The tubules of Shambaugh may be emptied of fluid by compression when the blood-

vessels of the stria vascularis and spiral ligament are filled with blood, when we are active; but in sleep, when anemia of the brain takes place, these tubules may take in fluid and so lessen the amount of endolymph in the cochlea-duct, allowing the perilymph to press Reissner's membrane on the tectorial membrane and thus act as a damper to incoming sounds, just as the eyelids help to keep out light when we go to sleep. Thus the tectorial membrane may be a factor in the complex problem of sleep by shutting out tone-sensation. Lessened amount of blood in the spiral ligament may be sufficient to lessen the tension on the basement-membrane causing a collapse of the ductus cochlearis.

Whatever theory is accepted it must conform with the anatomical structure, as well as with the laws of physics. The Helmholtz theory does conform with most of the physical laws of sound as far as we know them. It conforms with one of the anatomical facts, namely the variation in the length of the fibres of v. Hensen in the basement-membrane. Helmholtz has the key to the physical requirements but it does not seem to fit the anatomical findings. The Helmholtz theory does not require a tube within a tube, hence the endolymph would seem superfluous. The function of the tectorial membrane, the necessity of the rods of Corti in the higher mammals, the tunnel of Corti, and the inner and outer hair-cells, all these anatomical structures with the exception of the spiral ligament to vary the tension of the fibres of v. Hensen seem unnecessary for the peripheral analysis of sound by the piano-theory of Helmholtz. Some theory which would give every structure of this wonderful analyzer of sound an action, would be nearer the truth. The cochlea has been moulded by the physical effects of sound through centuries of development, hence every curve and every structure has its purpose. This suggests that variations in structure may be hereditary, and play a part in otosclerosis. Faulty structure would cause the spiral vibratory pressures (sound) to deviate from the proper channels and bring about mechanical irritation, causing the early stage of hyperemia, to be followed by osteo-porosis. This problem and others are awaiting solution through animal experimentation. If there were no sound there would be no cochlea, and if no cochlea, there would be no hearing.

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BACTERIEMIA IN ITS RELATION TO PURULENT OTITIC DISEASE.*

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The subject of bacteriemia in its relation to purulent otitic disease is of comparatively new interest to otologists, although bacteria were found in the blood by Weichselbaum¹ as long ago as 1884; he noticed the tubercle bacilli in the clotted blood taken post-mortem from the placental veins and from the heart and also from the fluid blood from the femoral vein in three cases of miliary tuberculosis. As this writer then said, "these cases teach that the tubercle bacillus circulates in the blood, an assertion made by Weigert as far back as 1870." About this time Meisels² found the same bacillus *intra vitam* in the blood in one out of the two cases of acute miliary tuberculosis examined. In 1885, Ruetimeyer³ found tubercle bacilli *intra vitam* in two cases in the blood and an extract taken from the spleen. Since this time a large number of investigators have corroborated these findings of bacteria in the circulating blood. It is now known that in ninety-five per cent of typhoid cases the bacillus is found in the circulating blood during the first week of illness, and in all of the specific infectious diseases, that is, such in which a particular micro-organism is responsible for the characteristic clinical and anatomical manifestations, the causative micro-organism has been cultured from the circulating blood. It would lead too far to take any exception, particularly to the technic in some of the cases reported in which the micro-organisms were found in the circulating blood, and the fact that other investigators have found the micro-organisms in the same infectious diseases with an acceptable technic makes a critique of culture-method in these specific cases unnecessary.

It should be mentioned that in other infectious diseases, to which as yet no specific micro-organism can be related as the particular causative agent of the disease, a variety of micro-organisms have been cultured from the circulating blood, as in the exanthemata and other infections too well known to need enumeration here. On the other hand, it must also be noted, that in a number of infectious diseases with different clinical characteristics and where each

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has its own pathologic entity, the same class of micro-organism has been cultured from the circulating blood as instanced by Luedke and Polano,⁴ who, "out of 31 cases of streptococcus infection, found this micro-organism in the circulating blood distributed in 23 cases as follows: 7 times in sepsis cases, 3 times in tubercular cases (severe cases before death), in 1 case of endocarditis, one of cerebro-spinal meningitis, in 2 cases of chorea minor (one had rheumatism and endocarditis and one had influenza and angina), in 2 cases of simple angina, in 4 cases of scarlet fever and in 3 cases of pneumonia." These findings can be accepted, because it is known of streptococci especially that they show great resistance to the bactericidal activities of the tissues and of the bodily fluids, and that in general, where there is a state of low vitality in which resistance to infection is decreased (loss of immunity, disappearance of complement?), the micro-organisms find favorable conditions to proliferate when they have once reached the circulation, yet, where the entrance of the micro-organism to the circulating blood is limited and resistance of the host is high, we may assume that the bactericidal substances of the blood can cope with and destroy them. Whether micro-organism grow or multiply in the blood itself after gaining an entrance into the circulation is not definitely settled. Calkins⁵ points out "that of the sporozoa (protozoa group) a particular one shows a selective affinity for a certain bodily organ which alone seems to give the proper environment for its habitat" and from this it is merely speculative to consider that a special species of micro-organism might have an as yet unrecognized specific adaptability to develop in a particular organic tissue, and here alone; in fact, some few of the micro-organisms seem to show some specialization of selective environment for development, as the diphtheria bacillus for that of the upper respiratory tract, the typhoid bacillus for that of the intestinal tract.

An interesting and important phase of the subject of bacteria in the blood is that of a "latent bacteriemia." Luedke⁶ cites Bruce, who found in 80 perfectly healthy negroes, 23 (29 per cent) who showed in their blood the *trypanosoma gambiense*. Busse⁷ found typhoid bacilli in the blood of three cases of tuberculosis and in one case of pneumonia, none of them having typhoid at the time. Conradi⁸ found para-typhoid bacilli in the blood and dejecta of 15 different healthy persons. Rimpan⁹ also found the para-typhoid bacillus in the blood of a healthy woman. Luedke⁶ says: "Numerous are the factors which favor the latency of germs in the circulating blood, the nature of which has not as yet been sufficient-

ly explained. A more or less pronounced adaptation of the bacteria must be recognized as the first condition for their persistence. The latency of the causal germs in the blood is of shorter duration in such animals as are naturally refractory to the corresponding form of infection. The disappearance of the germs from the blood, moreover, stands in direct relation to the quantity of the infecting material. The varying individual power of resistance tends considerably to the fast or slow disappearance of bacteria from the blood. The amount of blood used for examinations plays a decided rôle in judging of the bacterial content of the circulating blood."

No doubt there are still other factors, as yet inexplicable and further comment is needless except to consider that the blood amounts to about one-nineteenth of the body weight of man and to emphasize the probable possibilities for discovering latent bacteria in the blood if more blood were available than the amount drawn for culture, which varies from the usual 5 to 10 cc. up to, in rare instances, 25 cc.; this is certainly in small proportion to the whole and leads one to venture the statement that given a large supply of blood for culture, a latent bacteriemia would be a far more frequently observed phenomenon.

Of like interesting moment is a "latent microbism" whose presence is well known in pathological tissue without symptoms, but there is also much evidence to show that such a condition likewise exists in healthy or apparently healthy tissue. Luedke⁶ defines "latent microbism" as "the vegetation of viable germs in the animal organism without the presence of the bacteria asserting themselves by the clinical manifestations of a specific infection." A frequent example of this condition is the healthy so-called "typhoid carriers." Favorable also for a latent microbism are the existence of pathogenic diphtheria bacilli, streptococci and pneumococci in the oral and pharyngeal cavities and the meningococci in the naso-pharynx of healthy individuals. Pathogenic germs have been found in the lymph glands of freshly-killed normal animals and Duerck found on the under-surface of the lungs of healthy domestic animals, freshly-killed, staphylococci, streptococci, pneumococci, *B. Friedlaender*, *B. coli* and *sarcinae*. Hess found pyogenic cocci and coli bacilli in healthy tonsils, cervical, bronchial and mesenteric glands. In children, tubercle bacilli were found in glands without the slightest trace of any pathologic change, as quoted by Luedke. Conradi with a rigid sterile technic, "by taking the half of a small piece from the interior of the organs of the different slaughter-house animals, puts the piece in boiling oil (200°) for

one-half to one minute and then lays it in a 2 per cent bichloride solution for four hours. It is then put into sterile tubes, sealed airtight, and kept at 37° in a sterile moist chamber. Cultures from the various plate-media, which were smeared from the interior of the pieces, are examined after twenty hours, and out of 162 sterile samples from the animal organs, 72 were found to contain bacteria. Out of 63 normal-appearing livers, 42 contained bacilli or in about two-thirds of the samples; of 59 pieces of muscle, 18, or about one-third had positive findings; of 19 kidneys, 6 contained bacteria, or about one-third; of 5 lungs, 4 were positive; of 4 lymph glands, one, and out of 4 spleens one, which all seems to prove that bacteria can vegetate in the organs of normal animals. He found *B. coli communis*, *B. mesentericus*, *B. lactis aerogenes*, streptoc. *acidi lactici*, *B. fluorescens non liquefaciens*, dip. *pneumoniae* Fraenkel, *B. sinpestifer* and some unidentified forms, all of these of the aerobic and of the anaerobic; he found out of 72 positive samples, 32 varieties of anaerobics which mostly belonged to the butyric acid bacilli. He considers his findings important to pathological physiology and that perhaps the latent bacteria vegetation in the normal tissues of the body may explain the traumatic infections and the pathogenesis of such mixed infections as the cryptogenic and auto-infections. He further offers the theory that in the normal organs the bacteria are only symbiotic, parasitic, harmless and may even be useful to the host. Irrespective of the bacteria found in the blood under apparently normal conditions (latent bacteriemia), from the great number of these corroborative reports, the deduction may be made, that any infectious disease can show a bacteriemia at some time during its course and even after recovery.

If any apology be needed for the foregoing preamble, this statement, taken from Luedke, may suffice: "After these many censureless examinations, which show the presence of bacteria in the tissues of healthy organs, the view of a bacteria-free, intact body is no longer tenable." This statement the writer believes to have a direct bearing on the possibility of a latent bacteriemia occurring at any time, without the septic conditions prevailing that may be concomitant to an infectious disease, and if these presentations can be admitted syllogistically as the premises, the logical conclusion follows that a latent bacteriemia can also occur in purulent middle-ear disease, without any evidence of septic intra-cranial involvement. In substantiation, the report of a case by Uffenorde¹⁰ may be cited, where the same micro-organism was cultured from the

sinus, the median vein and from the pus of the middle-ear and antrum, without any phlebitis or thrombosis of the internal sinuses nor was there any change in any organ at autopsy to account for the general sepsis. He cites two further cases of purulent otitic disease with like cultured findings that ended in recovery; here the local pathologic conditions were probably similarly negative as to intra-cranial involvement and probably also without any other organic changes.

That the greatest number of cases of bacteriemia in purulent middle-ear affections are due to the entrance of bacteria into the circulating blood from an infection atrium within the zone of the local disease cannot be gainsaid, and having a micro-organism as the actuator of infection in such close proximity to the vascular system as obtains in a temporal bone harboring a purulent middle-ear condition, with its inflammatory changes often extending to the vessel wall, the presence of bacteria in the circulating blood in sinus involvement as found by investigations carried out during recent years, is not to be wondered at.

With the purulent middle-ear disease as a nidus of infection, it is generally admitted that most cases of otitic septicemia or pyemia are traceable to inflammatory involvement of the sigmoid sinus. The possibility of an otitic septic process being transmitted directly through the bone capillaries, the lesser venous system (osteophlebitis) or lymph channels or that of the acutely inflamed mucous membrane of the tympanic cavity, while comparatively rare, however, is conceded by good authority and such cases have been reported. Of the intra-cranial ear complications, otitic septicemia or pyemia is that most frequently encountered and this in most instances arises in connection with a phlebitis-thrombosis of the sigmoid sinus. (The term "phlebitis-thrombosis" is used advisedly. It is usually expressed "thrombo-phlebitis," which, to the writer, seems erroneous, since the phlebitis pathologically precedes the thrombus formation, as will be seen further on). Less common in otitic septic conditions, either as an accompaniment or sequela, is the infectious involvement of the meninges, the extension of the infection to the other venous sinuses or their tributaries, the formation of a brain or cerebellar abscess or a purulent labyrinthitis. The above less common complications of purulent middle-ear disease just recited have no interest in this paper, it being more the purpose to decide in an expository way what relation a bacteriemia, occurring during a purulent middle-ear infection, has to a sigmoid sinus phlebitis or thrombosis. The possibility of a bacteriemia arising in

purulent middle-ear disease without involvement of the sinus, from what has been said before, needs no further augmentation.

Does a phlebitis and a thrombosis of the sigmoid sinus stand in the same relation to a bacteriemia occurring in purulent middle-ear disease? A phlebitis of the sinus is a direct extension of the inflammatory processes to the sinus or vessel-wall and may effect the same either partially, limiting itself to the adventitia or may extend itself through the media including the intima and so involving the whole vessel wall in its three layers. With the increased local leucocytosis about the inflammatory process of the intima, one might admit the possibility of the bacterial actuators of the infection being carried into the blood-stream by the leucocytes, or, it being supposed that bacteria can enter the unbroken skin or the uninjured intestinal wall, one can assert that in the same way they may gain ingress to the circulation through the unbroken, albeit inflamed (which would be a more favorable condition) sinus wall. If this be granted, then a bacteriemia can occur here without a thrombosis, a tenet of pathologic faith that, of course, can be assumed only dogmatically, though Weigert, Leutert and others uphold the contention that bacteria can enter the circulation from the normal vein wall. One can readily grant the entrance of bacteria into the circulation through a minute necrotic place in the intima of the sinus wall, and at such a place of injury to the sinus wall due to the initial inflammatory changes (not necessarily necrotic), the point of election arises for the formation of a thrombus; therefore the phlebitis is the direct precursor of the thrombus since this injury or inflammatory insult to the vessel-wall is one of the principal factors in thrombus formation, the other factor being a slowing of the circulation. As to the infection of the thrombus, this is to be considered only as a secondary and later process and in no way related to thrombus formation, *per se*. Lubarsch¹¹ systematically examined venous thrombi in the different infectious diseases post-mortem and out of 215 cases, found micro-organisms microscopically in only twenty of the thrombi.

Here it is opportune to examine the theory of thrombus formation as promulgated by the more recent investigators in this field of histology. Except to mention the differentiation made by Eberth and Schimmelbusch¹² between the conglutination thrombus occurring in the circulating blood in a physical manner (the white thrombus) and the coagulation thrombus occurring in stagnant blood in a chemical manner (the red thrombus) there is no reason to detail the theoretical controversies of the various investigators. The con-

glutinative thrombus as it occurs in the circulating blood alone merits our attention and with as much brevity as lends clearness, quoting freely from Zurhelle's¹³ paper, the formation of thrombi will be considered. Two factors enter into the formation of a thrombus—slowing of the circulation and injury of the vessel-wall, of which the latter seems to be the most important. From the physical experiments of Poiseuille and Helmholtz it is known that the fluid current of a stream in a tube is slowest or almost stationary at the moist walls of the tube and that the speed of the current increases toward and is fastest at the axis of the tube, and this applied to the blood-stream explains in the simplest manner why the leucocytes move slowly in the plasma-filled peripheral inner zone of the blood-vessel and why the axial current moves the red corpuscles and blood plaques with greater celerity. The blood-current has been estimated by Eberth and Schimmelbusch as 10 to 20 times slower at the zone of the vessel-wall than at the axis. The slowness of the current accounts for the accumulation of leucocytes along the inner wall of the vessel and with a greater slowing of the blood-stream the blood plaques in greater number also accumulate here. This stage of the markedly slow blood-current with the blood plaques at the vessel-wall, is the favorable condition for thrombus formation. The least injury to the inner vessel-wall (intima) allows the blood plaques to adhere at this point. (Blood plaques or blood platelets are oval or spheroidal bodies from 1 u. to 3 u. in diameter and occur in the normal blood in considerable numbers; they stain faintly with methylene-blue and other basic dyes. Their origin and physiology has not yet been determined). Zurhelle¹³ says that "slowing of the circulation, if of long enough duration, can probably damage the vital qualities of the vessel-wall by the reduced vasa vasorum action, anemia and more so if there is pressure from tumor mass." According to Lubarsch,¹⁴ 77.5 per cent of the thrombi are venous, whereas only 22.5 per cent are found in the arteries, which shows decidedly that the slowing of the circulation is an important factor for thrombus formation. It may be added that in the temporal bone-area the S curving of the sigmoid sinus furnishes a natural barrier to the blood-current, which may have much to do with retarding the venous circulation at this particular situation.

It has been pointed out sufficiently in a previous part of this paper how the vessel-wall is damaged by the extension of the inflammatory process, this accounting for the other no doubt main factor of thrombus formation-injury to the vessel wall. That the

infection of the thrombus has primarily nothing to do with its formation and that it is clearly a secondary process, is supported by the animal experiments of Talke,¹⁴ who introduced cocci cultures into the immediate vicinity of the blood-vessels and so caused local thrombi. These thrombi examined after 9, 16 and 18 hours, contained no cocci, only one of those of 20 hours' duration and one at 23 hours and those of later duration up to 72 hours contained the micro-organism, proving that they enter the thrombi secondarily. Most of his preparations in which the thrombus was caused by the peri-vascular inflammation and pus showed that the thrombi formation preceded the entire transmission of the pathogenic micro-organisms. He emphasizes the statement that the cocci did not cause the thrombus by their settlement on the intima, but that the thrombus was caused by way of the inflammatory changes, brought about by the cocci. "From this it seems then that the infection can cause conditions that favor the formation of a thrombus and in this way alone does infection stand as an etiological factor in thrombus formation. It is possible that micro-organisms can directly cause a slowing of the circulation and so thrombus-formation where there is vasomotor paralysis due to reduced blood pressure causing scanty nutrition of the vessel wall, etc., in very severe infections. Yet the very severe infections run their course without thrombosis, where on the contrary, in most of the thrombi cases after operations there is no evidence of severe infection." Zurhelle.¹⁵ This author made the following animal experiments in reference to thrombus formation. Under strict asepsis, with proper bacteriological control, the experiments were made on the circulating blood of the rabbit. Fine silk threads (00) were passed through the external jugular veins and in other experiments through the carotid arteries; some threads were sterile, other were infected; some were merely pulled through the walls, other threads were allowed to remain in the lumen of the blood-vessels and the skin-wound was sutured. After a definite time, from 5, 10, 15 and 30 minutes to 24 hours, or a few days in the vein tests and from one to 3½ hours in the artery tests, the vessels through which the threads were passed were tied with silk above and below and excised, fixed, hardened and embedded in paraffin. Serial sections were made and stained and in every case under the microscope, typical blood plaque thrombi were found without any trace of fibrin coagulation. Only at the place of injury to the vessel wall were the thrombi found and all were of the same construction, irrespective whether the thread used had been a sterile or infected

one. In none of the cases was a thrombus found at the intact vessel-wall, but always at the site of injury. Other experiments were made by damaging the wall of both the veins and arteries, with the blood coursing through them, by cauterizing the vessel-wall with nitrate of silver. Here too, thrombi were only formed at the place of injury to the vessel wall, at the beginning of the healthy intima, the thrombus formation ceases. This can be admitted as proof that even the inflammatory condition brought about by cauterization, without perforation of the vessel as in the other experiments, is sufficient insult to the vessel-wall to cause the thrombus formation.

Mindful of the fact that these are animal experiments and not applicable as such to man, yet enough can be gleaned, in comparison, from these observations, that has significance for the subject of local thrombosis in man.

Thrombus formation in the sigmoid sinus has a like causation as that artificially produced in the animal vessels,—injury to the vein wall, inflammation of the venous coats even without perforation as we have noted, being a sufficient factor along with slowing of the circulation and the same constructing elements which enter into the formation of the artificial thrombus have been demonstrated histologically in man. While it is true that most of the sinus thrombi have been found infected, this is probably so, because the majority of those examined either at the time of operation or at autopsy are of the later stage. In fact, younger thrombi have been found sterile.

As an addendum to this matter of thrombus-formation the following is included as a theoretic supposition. By several investigators a substance known as thrombo-kinase (which is probably an enzyme or ferment) was extracted from the grindings of animal organs and tissues as the lungs, liver, kidneys, muscles, blood-vessels, etc., which has the property of enhancing the coagulability of the blood. Sahli,¹⁵ in his study of hemophilia, comes to the conclusion "that the cause of absence of natural blood-clotting in hemophilia is to be sought in that the injured blood-vessel wall, at the place where the thrombus ought to be formed, does not furnish sufficient quantities of thrombo-kinase or zymoplastic substances necessary to produce fibrin-ferment from the thrombogen or beta-prothrombin." While it was thought that thrombo-kinase, so far as the blood-vessels were concerned, was inherent particularly in the adventitia, Bernheim,¹⁶ in recent experiments, demonstrated that it was contained alike in all three coats of the blood-vessel.

From this the analogous inference may be drawn that, since the absence of the thrombo-kinase from the injured vessel in hemophilia (if this be so) prevents the formation of a thrombus, its presence and liberation at the site of an injury to the vessel-wall may offer another factor for the creation of thrombosis.

At the Manhattan Eye, Ear and Throat Hospital, blood cultures were made in forty-nine cases of acute and chronic middle-ear suppuration, of which number five showed a bacteriemia; four had streptococci and one had staphylococci in the blood. Eight of the remaining cultures were contaminated and thirty-five were sterile. Appended are the abridged histories of the five positive cases:

Case 1: No. 555,060. Dr. Duel's clinic. Female, age 26 years; admitted for radical operation, March 26, 1910; post-operative wound slow in healing. June 11, 1910, complained of occasional nausea which had persisted during the previous three weeks; admitted again to ward, the nausea and vomiting continuing during the next three weeks. No further operation; highest temperature 102.8° F. Recovered and discharged July 4, 1910. Blood culture, streptococcus.

Case 2: No. 548,002. Dr. Duel's clinic. Male, age 45 years; admitted January 10, 1910; Mastoidectomy on right, extensive exposure, dura and sinus apparently normal; patient died January 12, 1910, with symptoms of intra-cranial complication; temperature on admission 101° F. and rose to 105° F. shortly before death. Blood culture, long streptococcus.

Case 3: No. 527,340. Dr. McKernon's clinic. Female, age 24 years; admitted April 26, 1909, for O. M. P. A. mastoiditis; paracentesis on admission. Discharged May 5, 1909; no further operation; temperature never rose above 102.4° F. Blood culture, streptococcus.

Case 4: No. 546,622. Dr. McKernon's clinic. Female, 29 years; admitted December 18, 1909. Mastoidectomy, December 20. December 22, temperature 104° F.; blood culture taken. December 27, died of meningitis; temperature before death 107.2° F. Blood culture, staphylococcus, gram +.

Case 5: No. 573,997. Dr. McKernon's clinic. Male, age 18 years; admitted October 8, 1910; temperature 102° F., vacillating up to 106° and twice down to subnormal. October 11, mastoidectomy, sinus operation and resection internal jugular. Urine showed much sugar; smear from ear on admission showed pneumococcus. Died of meningitis, November 1, 1910. Blood cultures (October 8, 10 and 15) long streptococcus.

Out of the five positive cases, two had no apparent intra-cranial involvement, yet showed a streptococchemia on blood culture. The cultural technic used was the same in this series of forty-nine cases as described by Duel and Wright,¹⁷ who reported a previous series of fifty-seven cases of blood culture, two of which were in frontal sinus cases and fifty-five in middle-ear cases and of this group fourteen showed a positive bacteriemia, and of this number, nine cases were of mastoiditis without complications, all of the patients recovering after operation without any intra-cranial sequelae. In this report are also mentioned by courtesy of Dr. McKernon, four additional positive cases of bacteriemia in simple mastoiditis in which there was no clinical evidence of sinus involvement. These cases ended in uneventful recovery.

In culling this mass of demonstrative evidence it will be seen then, that a bacteriemia occurring during a purulent middle-ear disease, of and by itself—without taking into consideration the clinical symptoms and objective manifestations that are observed in a sigmoid or lateral sinus thrombosis, cannot be taken *ipso facto* as indicating this condition of thrombosis, nor can it alone be taken as a pathognomonic sign and therefore when found be indicative for operative interference within the sinus precincts. Neither does a bacteriemia in purulent middle-ear diseases indicate the presence of an infected thrombus in the lateral or sigmoid sinus, the thrombus if present most likely remaining sterile till a late stage. During this late stage the thrombus, by disintegration, may cause distal metastasis; but before this late stage the micro-organisms have already reached the circulation by one of the devious ways mentioned in an earlier statement.

In view of the conditions necessary for the formation of a thrombus as expounded here, having in mind particularly the important part played by injury to the vessel wall, the method, as practiced by some otologists, of aspirating the blood through the sinus wall for cultural or other diagnostic purposes needs to be mentioned only for condemnation. It is a formidable procedure, favoring the formation of a thrombus in a case where none previously existed.

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A Case of Acute Mastoiditis with Fistula into the Interior of the Cranial Cavity. J. CONSIROLES. *Rev. Hebdomadaire de Laryngologie, d'Otologie et de Rhinologie*, March 23, 1912.

The patient, a man of 54, presented symptoms of acute mastoiditis with an external fistula. At the operation the curette was passed through the necrotic tissues to the dura mater which was bare and covered with granulations. The meninges were also covered with granulations. Extensive curettage was carefully done and chlorid of zinc applied to the remaining granulations. A month later the patient was discharged cured.

SCHEPPEGRELL.

REPORT OF CASE OF MUCOCELE OF THE FRONTAL SINUS WITH DILATATION.*

BY GAYLORD C. HALL, M. D., LOUISVILLE, KY.

The following case is reported on account of its rarity, as well as because of some of its unusual features. The patient, C. G. M., 20 years old was seen October 23, 1910. About eight months ago he noticed swelling and protrusion of left eye. This has persisted, gradually getting worse, except on two or three occasions, when he thought the swelling subsided a little. At present the eye is decidedly prominent; a unilateral exophthalmos; no pain except lately, and then only slight; sometimes dizzy; chief complaint is diplopia; vision but slightly affected, 6-9 against 6-6 in the other eye; pupil is dilated and inactive; tension normal; eye can be displaced backwards by pressure, without pain. The displacement of the eye is chiefly downwards and perhaps a trifle inward. (See photographs.) Ophthalmoscopic examination showed fundus normal, except for a slight engorgement of the veins and blurring of the disc.

The nose was next examined. The septum deviated to the left above, closely wedging in the middle turbinal. No discharge could be obtained, even after shrinking the parts and applying suction. The patient was closely questioned concerning the occurrence of a discharge, particularly at the time he thought the exophthalmos subsided, but no history was obtainable. He was not subject to colds, and was particularly free from any nasal symptoms.

The sinuses were next illuminated; both antra were clear, and nothing unusual noted; both frontals, however, lit up brilliantly over a larger area than I had ever noticed. It extended to the external angular process and above to the hair line.

On palpation around the rim of the orbit pressure above and backwards brought under the fingers an irregular, nodular mass that seemed to spring from the roof of the orbit and extend backward as far as could be felt. Pressure here caused pain.

Following a consultation, exploration was decided on, the diagnosis resting between an orbital growth and an affection of

*Read at the meeting of the Jefferson County Medical Society, April, 1911.

the sinuses. The patient was accordingly operated on December 29 at St. Anthony's Hospital. A canthotomy was first done to insure wide retraction of the lids; the conjunctiva was next opened at the inner side, the rectus internus lifted up and secured with a suture and cut, leaving a stump on the ocular side to insure easy replacement by suture. The finger was then inserted in the muscle-cone behind the eye and explored for a tumor. None was found, though the optic nerve was followed back to the foramen. Above, a boggy mass without definite outline was felt.

The internal rectus was next sutured in place and the conjunctiva closed. After this an incision was made along the



Figure 1. Before operation.

brow down to the bone. At the nasal side the knife entered a large cavity and clear, straw-colored fluid gushed out. The soft parts were properly retracted and the opening in the bone enlarged. The appearance of the bone was peculiar. While not necrotic, it was soft, cut easy and had a water-logged appearance.

The opening was enlarged to admit the finger and showed an enormous frontal sinus, which confirmed the findings at the transillumination. The sinus extended outward to the external angular process; above, about an inch and a half; backward, the same distance.

Palpation below showed that the bony roof of the orbit had been entirely absorbed. This, of course, explained the exophthalmos, which was caused by the pressure downward and forward of this sac. The growth felt through the upper lid was the infiltrated edge of the sac. The cavity was emptied of its fluid and stripped of a sticky tenacious membrane. It was then seen that the eye was naturally in place, after which the wound was packed and sutured except at its inner angle.

After the patient was off the table I regretted exceedingly that I had not pursued the operation further and removed the middle turbinate and ethmoid, and packed through the nose. This would probably have been the better method. It would,



Figure 2. Before operation.

however, have been an endless task to have attempted to obliterate such a sinus and had we succeeded in doing so would have but substituted one deformity for another.

By opening into the nose at the first operation I should have saved a second operation under local anesthesia, though in view of the outcome of the case I trust I shall not be criticised too harshly and can only plead in extenuation that the case appeared so obscured before the operation, with the presumption favoring an orbital growth, that we were not prepared at the time for a more extensive nasal operation.

The patient reacted nicely from the operation and was up the second day. The wound was dressed and packed every

second day. The discharge soon became purulent. Cultures showed a streptococcus, and stock-vaccines were given. The amount of discharge rapidly diminished and became mucoid in character, after which the cavity was injected with bismuth paste.

Occasionally patient noted discharge into the nose and on blowing with closed mouth and compressed nostrils, air could be forced through the opening in the sinus. After the sinus was injected with the paste an X-ray picture was taken, showing the area decreased in size but showing also an apparent involvement of the ethmoid, which was distinctly darker than the other side.



Figure 3. Before operation. Note direction of displacement; dilated pupil.

On February 18, 1911, under cocain at the office, the left middle turbinal was removed together with the ethmoid cells, and the left frontal sinus entered with Good's frontal sinus rasp. The wound was packed and the packing was removed on the second day. Difficulty in the after-treatment was encountered in keeping the wound open as the septum deviated above to the left. The external wound was reduced to a pin-point only, with a thin watery discharge. On April 19, the dressing was left off of the external wound, which had ceased discharging. The nose on the left side was still narrow with an adhesion between the external wall and septum in front. An occasional discharge is felt through the nose from the sinus. The eye is

practically in normal condition and gives no further trouble. Vision 6-6; muscular balance normal; pupils equal.

A review of the literature in the Index-Medicus of THE LARYNGOSCOPE for the past two years shows no case reported combining all the features of this one, though case-reports of mucocele of the sinus are by no means rare. Consulting the index of the surgeons general library the reports are likewise scanty, though this may be due to the fact that the volume



Figure 4. After operation. Taken to show scar when a direct front view is obtained. The depression is scarcely noticeable.

Figure 5. After operation.

classifying frontal sinus troubles was published about fifteen years ago when interest in the subject was not so manifest. Dr. Holmes of Cincinnati, in a personal communication, reports the observation of three such cases during twenty years. I have not gone more extensively into the literature, but believe such cases sufficiently rare to put on record.

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FIBROMA OF THE NOSE AND NASO-PHARYNX WITH SUDDEN MALIGNANT DEGENERATION.*

BY VIRGINIUS DABNEY, M. D., WASHINGTON, D. C.

A well-developed, ruddy-cheeked country boy of 14 years was referred to me for removal of a nasal growth seen protruding from the anterior opening of the left nostril. Upon examination this proved to be a hard, dense tumor, wedged in so tightly between the inferior turbinate and the anterior half of the septum that it resisted the introduction of the probe between it and the floor of the nose, as well as along the lateral aspect, yet tolerated manipulation, as it did not bleed at this examination. A thin, offensive, muco-purulent discharge escaped from the nostril when the tumor was moved, though none was visible in the rhino-pharynx, where was found resting upon the soft palate a similar growth, which, as subsequently was determined by digital examination, was attached to the basilar process by a well-defined pedicle, broad and flat. The history supplied by the parents and the family physician was strikingly simple: no luetic taint, no malignant disease in the family, merely obstruction in nasal respiration, beginning six months before, but not complete till a month before his visit to me.

Inasmuch as the left nasal chamber was plugged in front and behind with hard, fibrous growths, it was deemed prudent to attempt to remove as many as possible under local anesthesia in order to arrive at a more definite diagnosis of the nature of the tumors. In attempting this procedure on the protruding polyp, despite the use of a tonsil snare armed with No. 9 wire, the pedicle resisted so stoutly and the patient's suffering was so great that the procedure was halted. As an incident of the futile performance the powerful snare was bent beyond use, the staff buckling as the ecraseur was screwed back on it. Some days later under ether the removal of this polyp was accomplished with a tonsil snare, at which time ten others were secured, all hard, tough, grayish-pink tumors, which gave the operator the most serious difficulty in the purely mechanical part of engaging them close to their apparent origin. The hemorrhage, brisk after each removal, was easily controlled by

*Read at the meeting of the Society of Ophthalmologists and Otol-
ogists, Washington, D. C., November 17, 1911.

gauze packing, after which another would be attacked. Although the posterior opening of the nose was still closed, the patient's condition from loss of blood and the hour and a half of anesthesia was such that the operation was stopped. The anterior growth was attached to the middle third of the middle turbinate, but to my surprise, all the others were but prolongations of the parent fibroma in the rhino-pharynx, and these were so very dense in structure that some had to be cut through at their deepest part by a long pair of angular scissors. No blood escaped into the throat, due to the tightness with which the posterior tumor was fitted into the rhino-pharynx. Two weeks later, after half an hour's unsuccessful effort to engage the parent growth with the snare in the nose and finger in the mouth, two-thirds of the fibroma was seized with a powerful pair of adenoid forceps and divulsed, again without alarming hemorrhage. The usual effects of pressure were to be seen, such as the extreme deviation of the septum and the atrophy of the turbinates. There was no involvement of the antrum. Sections taken from the various tumors at random showed the true fibroma structure, perhaps with an unusual development of the fibrous element.

The patient, after a week in the hospital, was sent home to the country with a partially free left nostril, but only to return in six weeks with the report that his nose was again stopped. In short, in the space of six weeks the remains of the fibroma had grown 'till they filled the entire posterior nares, and respiration through either nostril was impossible. Repeated attempts with various instruments having failed to remove any considerable part of the growth, now deemed sarcomatous, electrolysis was tried every third day for a month, but the apparent improvement was transitory, though the sense of taste did return permanently, after being absent for several months. The radical operations through the face, and palate, disfiguring, dangerous and rarely permanently curative were not even thought of seriously, especially as sarcoma is so peculiarly fatal when the patient is under 25 years.

A week before his death, which occurred four months after the last treatment, he developed a cachexia and severe lassitude which compelled him to go to bed, where he lapsed into unconsciousness with periods of only a few minutes at a time when he recognized his family. His death was directly due to toxemia, as the sarcoma never encroached on the breathing-space below the

soft palate or penetrated upward into the brain, two other causes of death, nor were there any glandular complications, at least none were visible.

From an examination of the varied synonyms for the new growth under discussion here, it will be seen that the origin, clinical course, embryonic basal tissue and prognosis of the tumor are all suggested by the name itself, e. g., naso-pharyngeal polypus, fibroid tumor of the base of the skull, fibro-angioma of the naso-pharynx, retro-maxillary polypus. Gruenwald's sinister name for the growth, juvenile sarcoma of the naso-pharynx, is particularly suggestive and shows his pessimistic opinion of any fibroid growth in this region in the young. It must be ever borne in mind that such tumors generally yield no sarcomatous tissue under the microscope despite the malignancy that is either quiescent or subtly active. It is safe to say that they are clinically malignant though histologically benign,¹ which is partially explained by their origin from any part of the naso-pharyngeal fibrous structure, such as the basilar fibro-cartilage, the sphenoid, the adjacent parts of the internal pterygoid process, and, most commonly of all, the periosteum covering the sphenoid. My case serves to uphold the contention of Escat² that they are more often found on the left side. While the etiology of these growths is as obscure as that of tumors elsewhere in the body, yet the occurrence between the ages of 10 to 25 and their occasional atrophy after the latter age, in short, their activity being limited to the period of development would suggest some intimate connection between the two conditions. It has been recognized for a long time that embryonic tissue is prone to malignant transformation at the period of development, and these tumors are sometimes seen to be formed, in part, of round cells or the cells found in embryonic sarcoma. As a rule they are composed almost wholly of fibrous tissue, and, in those which bleed freely, many thin-walled blood-vessels are insinuated between the fibres.

The diagnosis presents no difficulty when the growth has reached any considerable size, but before that time any hard, tough, grayish-pink tumor, bleeding easily and growing rather rapidly should excite the suspicion and apprehension of the examining rhinologist.

Delavan's³ statistics alone would render unpopular the mutilating, dangerous external operations, such as removal of the superior maxilla, or the Broeckel operation, likewise the splitting of the soft palate, division of the hard palate with the preliminary tracheotomy and other formidable procedures. He has shown that under those

methods only 59.25 per cent were cured, while 25.9 per cent died, and 15.4 per cent recurred; but removal through the normal passages gave no recurrences and only 5 per cent mortality. The two sides of this question are well shown by two papers of recent date, though the literature is filled with examples, both pro and con. Farrell,⁴ of Utica, in a paper of unusual thoroughness, gives a very interesting account of his struggles in a case of sarcoma of the nose and naso-pharynx, in which he, assisted by a general surgeon, tried successively all the procedures advocated by the best rhinologists, including excision of the superior maxilla, splitting the soft palate and tying off the external carotid artery, after each of which operations there was great improvement. Thus he was able with appropriate general treatment during the intervals to prolong his patient's life for two years and a half, at the end of which time he died. Wells,⁵ of Washington, removed from three patients several immense fibrous polyps with the cold snare through the nose, assisted by the finger in the mouth, and there has been no recurrence after an interval of from one to three years. His paper reviews all the literature of recent date touching the choice of attack. Farrell admits that his experience with this one case prejudices him in favor of the intra-nasal method.

Where it is not unreasonable to expect involution of the tumor, electrolysis may do some good, and, at least is a justifiable measure, which cannot be said of puncture with the galvano-cautery, as it frequently has led to increased activity in the tumor growth, hemorrhage and septicemia. Doyen's⁶ method of separating the tumor from its attachment to adjacent structures with a raspator, working through the mouth, then scraping away the tumor with a species of adenoid curette, which is placed behind the growth and brought forward with considerable force, is good surgery and an excellent way of securing its removal; it requires special instruments, and much practice, however. Escat,⁷ Moure and Delie⁸ have modified and elaborated this operation with some degree of success. King⁹ does a tracheotomy, tampons the larynx and approaches the tumor through the nose with a specially devised long-handled scissors. A careful perusal of most of the available literature on this subject forces me to conclude that the intra-nasal method is to be preferred, next the Doyen operation, or some of the modifications which have grown out of it. Those procedures which involve the maxillary excision, or the lifting up of the alae and bony structure of the external nose have not seemed to the writer to be justified by the results or the history of the cases themselves.

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Gyergyai's Method of Direct Examination of the Naso-pharynx and the Eustachian Tube. A. VON GYERGYAI, *Ztschr. f. Laryngo., Rhinol. u. ihre Grenzgeb*, Bd. 5, Heft 1, p. 57, 1912.

The writer emphasizes the advantages of his straight instruments, invented 1½ years before Yankauer described his funnel-shaped one. The writer mentions that in 400 examinations no considerable injuries of the soft palate occurred, a statement that contradicts the one of Yankauer, that the straight instrument is more injurious to the soft palate than the funnel-shaped one. The writer considers Yankauer's instrument less suitable for the examination of the tube, the supra-tubarian fossa and the posterior part of the nose, as the field of vision is narrowed anteriorly on account of the funnel shape.

Dr. S. Yankauer replies in the same issue that his instrument is different from the one of Gyergyai; that he first undertook the examination in sitting position, and that a plain reflector is sufficient in illuminating his field of vision. By two drawings, the differences of the two instruments are illustrated and an explanation is given of why an injury of the soft palate is liable to occur by use of the straight instrument.

GLOGAU.

CIRCUMCISION OF THE UVULA.*

BY HAROLD HAYS, M. D., NEW YORK CITY.

A normal uvula is about a centimeter in length and hangs free in the oral cavity when the mouth is open and the organ relaxed. No part of it should touch the tongue. On contraction, its mucosa should fold up upon itself so that it shows as a deep and thickened indentation between the pillars of the fauces.

The uvula is composed of bundles of muscular fibers entirely surrounded by relaxed mucosa which hangs in folds. The muscular fibers are part voluntary and part involuntary and are derived from crossed fibers of muscles of the soft palate. This muscular tissue is well supplied with blood-vessels derived from the same source. The mucosa is also a continuation from the faucial pillars and in the majority of cases forms a loosely folded bag around the muscular tissue, being connected to it by fine bands of connective tissue.

The normal uvula is seldom felt by the patient. Any acute disease attacking it gives symptoms referable to the oro-pharynx and chronic disease is often associated with indirect symptoms which will be spoken of later. The most common of these conditions is chronic uvulitis due to a variety of causes of which chronic nasopharyngitis is the most important.

The symptoms of elongated uvula which might better be termed chronic uvulitis, are very indefinite and the condition *per se* may not give rise to any local symptoms at all; therefore a good axiom to follow is that even if the uvula be elongated, it is as well to treat it conservatively until other more important pathological conditions are attended to. Among the most important symptoms mentioned by Ballenger, Kyle, Coakley, Knight and others are a tickling sensation in the throat, and hacking cough which is partly due to the nasopharyngitis and partly to the irritation caused by the uvula lying on the base of the tongue and coming in contact with the epiglottis. Ballenger claims that patients have come for relief from the persistent hacking cough, fearing that they had tuberculosis. The distress from the persistent hacking has been so great that it has caused nausea and vomiting. However, there is one common and persistent symptom which is seldom mentioned and

*Read at the meeting of the Section on Laryngology, New York Academy of Medicine, April, 1911.

that is a thickened feeling in the throat, probably also caused by the chronic pharyngitis; and the sensation of a foreign body, in some cases reflexly indicated by the sensation of the body at some distance from the uvula.

In the treatment of chronic uvulitis, many methods have been employed. Palliative treatment applied to the alleviation of the associated condition often helps considerably; but palliative treatment of the uvula itself is of slight avail. Among these methods may be mentioned the application of 10 per cent silver nitrate, 2 per cent zinc chloride, alum, tannic acid, etc. The only palliative remedy I know of which causes any relief is the application of the electro-cautery to the posterior surface of the tip. However, as I have just remarked, such palliative measures seldom give any permanent relief.

Among operative measures may be mentioned numerous methods for shortening the uvula which may be done by means of a

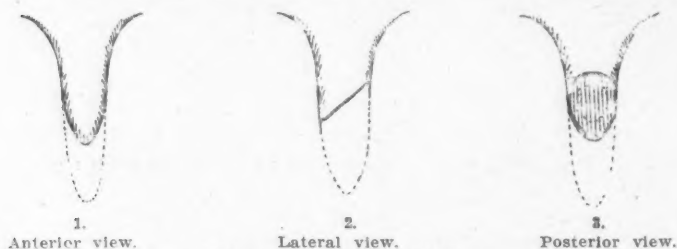


Figure 1. Ballenger operation.

scissors or a specially designed uvulatomer. I shall enumerate these measures briefly in the order of their importance:

1. Amputation of a portion of the uvula by making a straight cut at right angles to the organ with a scissors, knife or uvulatomer. Although this accomplishes the result desired, the wound must heal by secondary intention and on account of the impossibility of keeping the organ at rest and because of the passage of food over this denuded surface, the process of healing is very painful. Many patients have become completely aphonic for a number of days after this operation.

2. Removing the tip by means of a cold wire snare. This operation is open to the same objection as the other and may be considered decidedly unsurgical.

3. Ballenger's operation (Figure 1), which is performed as follows: (a) The uvula should be painted with a 10 per cent solution

of cocain. (b) The tip of the uvula is then seized with forceps and drawn directly forward. (c) While in this position the uvula is amputated with a heavy scissors, cutting upward and backward. Ballenger claims that this is a point of practical importance as in swallowing solid food, the raw surface is not irritated by it.

Although this operation is simple and satisfactory in the majority of cases, it is open to the objection that a raw surface is left which takes some time to heal and moreover may become infected from the purulent naso-pharyngeal secretions.

4. Casselberry's or Packard's Operation. (Figure 2). Up to the present time I believe that this has been the ideal operation. It is performed as follows: (a) Anesthesia is secured by applying a 10 per cent cocain solution to the uvula. (b) The tip of the uvula is seized with forceps and drawn directly forward. (c) A wedge-shaped piece of the uvula is removed with scissor or scalpel. (d) The anterior and posterior cut edges of the wound are sutured with black silk or cat-gut, the sutures being removed on the third day.



Figure 2. Casselberry operation.

The main objection met with in this operation is that it is difficult to make a straight cut in the uvula with a scissors or knife on account of the movability of the organ. Although the mucosa may be readily cut (but not always in a straight line), the excision of the muscular tissue is a difficult matter. Moreover, co-apting the edges of the mucosa is not always an easy matter.

On account of the objections to the various methods enumerated, I have devised the following operation, which I have called circumcision of the uvula: 1. The region of the soft palate is first sprayed with a 10 per cent cocain solution and the base of the uvula painted with pure cocain crystals. The entire uvula is then anesthetized by an infiltration anesthesia of a 1-10 of a 1 per cent solution of cocain (Figure 3, a). The injection may be made with a tonsil-needle, the injection being started at the base of the uvula and progressing downward toward the tip. About 30 minims of solu-

tion are used. After the infiltration the uvula will have increased to two to three times its size. (b).

2. As much uvula as one wishes to amputate is then ascertained. One wishes to have a uvula remain as near the normal size as possible. The tip is grasped between the blades of a long artery-forceps after passing it through the oval opening in the uvulatome which I shall now describe:

The author's uvulatome (Figure 4), works on the same principle as a Mackenzie tonsillotome in that the blade works by pushing it to. The blade of the instrument is angular in shape so that it cuts a V, the same as a cigar-cutter cuts a V out of a cigar. The instrument can be readily taken apart for cleaning.

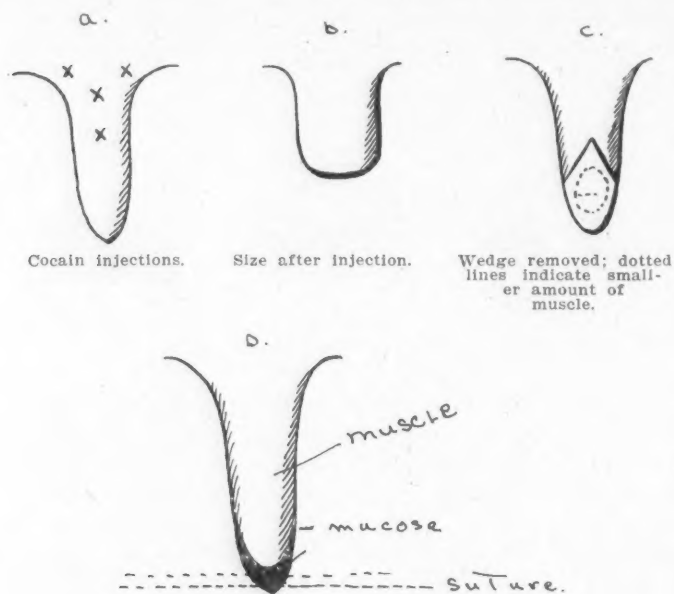


Figure 3. Author's operation.

3. When the uvulatome is once in place the blade is strongly pushed to; thus excising the portion within the blade (c). But the peculiarity of the instrument is soon apparent to one using it; for more of the mucosa is removed than muscular tissue, precisely what one wishes to do as the redundancy and laxity of the mucosa is what usually causes most of the trouble. If the cut has not been

made all the way through, it is a simple matter to finish it up with a sharp scissors.

4. When the portion desired is excised, one finds that the remaining mucous membrane covers the stump of muscular tissue. This mucosa is gathered together and united with *oo* catgut, tying one knot only, so that the suture will surely come away by itself. This suture may be placed with any fine-curved needle (preferably an enterostomy needle) used on any needle holder (d). By the method of anesthesia just described, there is absolutely no pain and for the purpose of suturing, the uvula can almost be brought out of the mouth.

5. No after-treatment of any kind is necessary except a gargle of peroxide of hydrogen for the following twenty-four hours.

Within the past two months, I have operated upon five patients by this method and the results were very satisfactory in all but one case, in which I used a silk suture instead of a very fine catgut. This necessitated my working at the uvula the following day to free the suture and this manipulation left the parts more sore than at the time of the operation itself. In all of these cases the patients were



Figure 4. The author's uvulotome.

able to go about their business and twenty-four hours after the operation had no difficulty in swallowing food. There were no untoward complications, no edema nor aphonia, results which had often accompanied the other methods of operation.

The reason why I call this operation a circumcision instead of an amputation is that the mucous membrane is cut around the muscular tissue and, although a part of the muscular tissue is excised, the mucous membrane is again brought over this stump. Thus when the operation is finished, no raw surface is left. The approximation of the mucous membrane cannot accurately be made so that a slight thickening takes place along the suture-line, which eventually necroses and forms a protecting film which later sloughs off.

The advantages claimed for this operation are the following:

1. Absolute painlessness when infiltration anesthesia is employed.
2. Precision and simplicity.
3. The patient is not inconvenienced by the operation and needs very little or no after-treatment.

11 West Eighty-First Street.

AN UNUSUAL CASE OF ELONGATED UVULA.

BY CHARLES W. KOLLOCK, M. D., CHARLESTON, S. C.

Cases of elongated and enlarged uvula are not uncommon, but the elongation in the case about to be reported was so unusual that it seems worthy of recording. A white man consulted me for some trouble with his "palate," which he said had been going on for about six months. When the mouth was opened for examination I thought that there was a worm in his throat, and having known that the lumbricoids at times emigrated from their haunts by this route my first thought was of that occurrence. A moment's examination, however, showed that what at first appeared to be a worm was the uvula elongated and stretched to such an extent that it reached and was caught between the two upper incisor teeth. The end had become flattened and disc-shaped from being constantly caught and held in this position. Whenever he coughed or expectorated the uvula flew into this place and there was held until he released it with his finger. At other times it lay either on the tongue or dropped down the throat where, strange to say, it caused but little if any irritation. The elongated portion was removed, and as nothing has been heard from him since it is reasonable to suppose that he has had no further trouble.

On the Necessity of Placing the Professional Study of Singers Under the Control of Laryngology. HENRI LAVIELLE. *Rev. Hebdomadaire de Laryngol. d'Otol. et de Rhinol.*, May 4, 1912.

The author divides the subject into: (1) The physiology of the singing voice; (2) How the singer may use his voice to the best advantage, and (3) How the laryngologist may safeguard the vocal health of the singer.

The author calls attention to the importance of properly placing the voice, the lack of which results in many failures, and the necessity of properly instructing the patient in its scientific care.

SCHEPPEGRELL.

PROGNOSIS AND TREATMENT OF TUBERCULOSIS OF THE LARYNX.*

BY W. FREUDENTHAL, M. D., NEW YORK.

In looking backward over a period of some twenty-five years one of the first topics in which the writer took a scientific interest was laryngeal tuberculosis which still interests him greatly. Our views in regard to the prognosis of the disease have changed materially. As late as 1880 and 1881 Krishaber of Paris, pronounced the absolute incurability of laryngeal tuberculosis, and the medical world rested under the shadow of that pessimistic view up to the time when Hermann Krause of Berlin published his observations with lactic acid, and Heryng of Warsaw his results with the curetment of the larynx. From then dates the beginning of a new era, a period of greater hopefulness as to the outcome of laryngeal tuberculosis. Having been an assistant in the clinic of Professor Krause at that time, i. e., in 1885, the writer's statements are based to a great extent upon his personal experience. Very soon a third laryngologist joined the ranks of the optimistically inclined, viz., Moritz Schmidt of Frankfort on the Main. It was due to the efforts of these three that a greater interest was taken in laryngeal tuberculosis. Through the aid of many others that degree of prognostic optimism was reached with which the writer would like every laryngologist and every general practitioner to be imbued. For it is especially the latter who still clings to the views of Krishaber, to the ideas of the pre-cocain and the pre-laryngological era, i. e., those of hopelessness. We have all reason nowadays to be optimistic in many cases of laryngeal tuberculosis, for the cures that have been achieved are no longer the exceptions. Unfortunately the writer is not in a position to give statistics of all the cases seen or treated by him, since this would involve a much greater sacrifice of time and labor than he is at present able to give. But from experience we have learned many lessons which will be presented in this paper.

The first one is that the curability of tuberculosis of the lungs depends very much upon the cure of the laryngeal condition,

*Read at the meeting of the American Academy of Ophthalmology and Oto-Laryngology, Indianapolis, Indiana, September 26, 1911.

and the curability of the latter in many instances upon the removal of the lesions of the air-tract above. In every sanatorium for tuberculosis patients each and every newcomer should be examined as to the condition of his upper air tract and, if necessary, be treated accordingly. We know that such a little thing as a post-nasal catarrh may keep up an irritating cough which will not let an ulcer in the larynx get well, and that again will act as a source of irritation to the lower respiratory tract.

That even minor operations on the nose and throat should be performed with great conservatism and equally great care as to the loss of blood, etc., is a rule established in those institutions with which the writer is connected. Major operations are done only in case of extreme necessity, as they always render the prognosis doubtful. When care is taken of the upper air-tract the prognosis of laryngeal tuberculosis assumes a different aspect. This is especially noticeable in cases in which we have primary manifestations of tuberculosis in the larynx, in other words, those in which clinically a tuberculosis of the lungs cannot be demonstrated. Here a diagnosis is difficult and often arbitrary. The prognosis is good if patients are placed in the proper climate and under proper treatment.

There is, however, one distinct class of primary tuberculous affections of the larynx to which I should like to draw your attention—that presenting laryngoscopically the appearance of pachydermia of the larynx. Therapeutically a great deal can be accomplished in these cases if their true nature is recognized at an early stage. But therein lies the difficulty. Laryngoscopically you obtain a picture that may indicate lues, or carcinoma, or it may resemble pachydermia. This is not the place to go into the differential diagnosis of these affections although the writer feels tempted to do so as pachydermia of the larynx is mentioned but rarely nowadays. Suffice it to say that not infrequently cases have been treated for a specific laryngitis when, all of a sudden, the pulmonary tissue has broken down, and within a remarkably short time the patient has succumbed to pulmonary tuberculosis after the typical symptoms of the disease have shown themselves in the larynx as well. On the other hand, the writer remembers three distinct cases presenting the picture of pachydermia of the larynx that have been cured permanently. In these cases the lungs were examined

and incipient tuberculosis found. Ordinary treatment brought about the cure. I should therefore urgently advise examining the lungs in every case where there is the least doubt as to the diagnosis of the laryngeal condition. Then when tuberculosis is found and the patient treated accordingly the prognosis in many instances is not bad.

Much graver is the outlook in secondary affections, but again I repeat by no means hopeless. It is here that experience and great perseverance count, and occasionally they will be crowned by success even in apparently hopeless cases. Although the extent of the process in the larynx and lungs is not always the same, the one depends upon the other for a cure. If the pulmonary condition be rapidly growing worse the patient will go down in spite of all our therapeutic efforts directed to his larynx. Again, if the laryngeal condition is far advanced and the patient is unable to swallow food, his pulmonary affection though limited, will progress and other parts of the lungs will break down. Naturally, there are exceptions to every rule and to this one as well. An ulcer in the larynx may become cicatrized and the whole laryngeal condition healed while the process in the lungs takes a contrary course. Whether primary or secondary, the lesions are either localized or diffuse, and that is of important prognostic value. At the same time the character of the lesion has to be reckoned with, and the manner in which the vocal apparatus reacts upon the invasion of the tubercle bacilli (Portela). When pulmonary tuberculosis is complicated by pregnancy the outlook is not good; it is absolutely bad when the larynx is affected. Kuttner of Berlin, the writer¹ and others have dealt with that topic, and almost all agree as to the unfavorable prognosis in these cases.

But taking all the forms of laryngeal tuberculosis together and reviewing the publications of men like Heryng, Finder, Gruenwald, Krieg, Beck of Chicago, Jobson Horne, Robert Levy, St. Clair Thomson, Mermod, Tapia, Spiess, and others, it is the consensus of opinion in which we coincide, that with our modern means of treating laryngeal tuberculosis the outlook is by far better than it was twenty years ago. Indeed, if the so-called phthiseo-therapists had not stood still during that period, resting on the laurels of H. Brehmer and Dettweiler but had advanced the way laryngologists have done the prognosis would have been still more favorable.

Coming now to the second and more important part of our theme, the therapy, it is not our intention here to repeat what we have said only a short time ago,² but rather to endeavor to look at the disease from a different and perhaps new standpoint. Thus, the question arises: What can we as laryngologists do in order to cure laryngeal tuberculosis, and thus exercise a beneficial influence on pulmonary tuberculosis? The answer is: Stop the cough, remove the dysphagia and occasionally also remove the dyspnea. This advice is easier given than acted upon, but it is by no means impracticable. If we begin with the first mentioned symptom, the cough, it is clear *a priori* that a cough originating in the lungs will exert a very bad influence on any ulceration in the larynx and pharynx. For every attack of coughing will mechanically irritate an ulcer in the larynx, and make it less resistible and less prone to heal up. But now the question arises: Does a cough in pulmonary tuberculosis necessarily always come from the lungs? The conception of tuberculosis is so intimately connected with the cough that not only laymen but also physicians frequently say: In such and such a case there is no cough, ergo there cannot be any tuberculosis present. This is decidedly erroneous as regards incipient cases and in these I dare say that there is never any cough present unless it is produced by some affection in the upper air-tract. You all have seen cases in which a hemophysis has occurred without any warning and, as a rule, without any pulmonary cough. This proves that whatever secretion there may be in the beginning of the disease is brought up into the trachea during the night by the mere action of the ciliated epithelia which swing in an upward direction. In the trachea it may be until morning when it is expelled by a simple clearing of the throat. During the day the secretion is so slight that it is not noticed. In advanced cases the secretion is too abundant for such an occurrence and besides the epithelia are gone to a great extent. Now, if the cough does not originate in the lungs, where else does it come from? If you examine such patients you will surely find a laryngitis or a post-nasal catarrh or other lesions in the upper air-tract to which it is directly due. By treating these conditions you will see how quickly sometimes a "lung" cough will disappear. For that reason I advocate a laryngological department in every sanatorium. Every patient whether he complains of the throat or not ought to be examined and, if necessary, treated regularly and thoroughly.

And here I will say I am a great believer in climate. When a catarrhal condition of the upper air-tract does not improve after thorough treatment or when it even gets worse, then lose no time, but send the patient to a different climate, a higher altitude, a dry climate or the seashore, just as the condition may require. By all means stop the cough in the beginning when this is easier accomplished than later on. *Principiis obsta*. The fight against the cough is the most important part in the treatment of incipient pulmonary tuberculosis and that part of the battle should and can be won by the laryngologist.

When, however, infiltrations have set in and ulcers have appeared even then climate or local treatment may do a great deal in curing these cases, but alas, that is not the rule. Too often only do we encounter cases in which it is impossible for the patient to secure any rest on account of the incessant laryngeal cough and in which the swallowing of food is extremely painful, rendering life a great burden. Even here, when the process is not diffuse but circumscribed ulcers are present the use of the galvano-cautery point does good.

Elsewhere I have spoken of the drugs to be recommended for dysphagia, and I may mention here that the use of cocain is decidedly contra-indicated. We do not want an anesthesia of the larynx, but a prolonged analgesia, i. e., painlessness lasting for days. That can be produced by orthoform, anesthesin, or propesin. The formulas used by the writer are given.² Nor have we changed our opinion in regard to the injection of alcohol. There will always be found ulcerations which we cannot reach by intra-laryngeal applications or powders, sprays, emulsions, etc., and for these injections of alcohol are to be tried by all means. They are somewhat painful for a few minutes, but when the initial pain has subsided a euphoria takes place and an analgesia sets in, lasting in some cases five or six days and even more. It requires a little experience to make these injections properly. If the needle is inserted too deep the alcohol will get into the larynx; if too superficial it will not reach the nervus laryngeus superior; a sure sign that you have struck the nerve is the intense pain. Avellis and Adolf Blumenthal of Berlin, have recommended the resection of the nerve and that seems to be feasible in exceptional cases. Bruenings advised the application of Roentgen rays through direct laryngoscopy. I have had no experience with that method.

FULGURATION. During last winter I employed a new method that will now be described. The way I came to use it was through the following case: H. S., an inmate of the Bedford Sanatorium for Consumptives, presented himself with a sub-glottic tumor that could not be reached by any instrument known. Consequently I tried to act upon it by means of fulguration. Under that treatment the mass disappeared gradually and the result was excellent. The constant irritation that he felt before was gone and the voice became clear after the reaction had subsided.

Removal by this means of benign growths from the bladder had been done before, but this, as far as I know, was the first time in which it was used for this purpose in the larynx. Having so clearly seen the caustic effect in this case we were naturally led to assume that the influence of fulguration on ulcers of the larynx would be equally good. As we can regulate the strength and duration of the application we were able to regulate it always according to requirements. The first case, the history of which I regret to say was lost, showed superficial ulcerations on the epiglottis and one epiglottic ligament (I write from memory). This patient improved so rapidly under fulguration that I thought it the best thing I had ever struck in laryngeal tuberculosis.

After that I tried it in a more pronounced case of ulcerative laryngitis. The patient gave the following history: Mr. F. L., 54 years of age, wine merchant, has had trouble with his throat for fourteen years. He is now absolutely aphonic, has severe dysphagia and has suffered from pulmonary tuberculosis for about a year. After having consulted a large number of physicians he was finally referred to me.

Present condition: Patient is very weak, coughs and expectorates incessantly. Both upper lobes of the lungs are much affected, and the larynx is in the following condition: Perichondritis of left arytenoid, infiltration (also sub-glottic) of left vocal cord; deep ulcer of right vocal cord covering almost its entire length, and ulceration on the posterior laryngeal wall with protruding infiltrations. He received injections of the propesin emulsion and commenced to feel easier; could eat and sleep somewhat better but progress was very slow.

December 7. Injection of monochlorphenol, which was painful and of no apparent benefit. December 13. Injection of al-

cohol which was followed by great relief, lasting about ten days. December 25. Another attempt with monochlorophenol, which again was unsuccessful. He then went to Asheville, where he was under the care of Dr. von Ruck, returning to New York in May much improved. His voice was no more aphonic, but still quite hoarse. There were ulcerations on the right vocal cord and the posterior wall. At this stage I commenced to employ fulguration. It was applied every second or third day for several weeks when the ulcers disappeared. He was again aphonic, which was due entirely to the reaction. He then went to Saranac Lake, where he was under the care of Dr. Lawrason Brown. His whole condition improved steadily and without any local treatment his voice grew stronger every day, so that when he returned to New York City in the beginning of September he spoke with a loud sonorous voice. No sign of ulceration.

It is my conviction that the restoration of the laryngeal functions was entirely due to fulguration. Of course, the beneficial influence of climate in Asheville and Saranac Lake was evident.

The mode of application is simple. If you have a high frequency current in your office you connect it with any handle. To that handle you attach a wire that is covered with hard or soft rubber which can be bent to suit the individual larynx. The current is turned on by an assistant only when your wire is in situ, or by means of a foot switch. Several applications of a few seconds' duration are enough for one sitting. The spark must be visible in the larynx or else no effect is to be expected. Consequently when the patient gags or closes his larynx it is necessary to interrupt the application.

The benefits of this new method seem to be manifold: First, there is a mild caustic effect that destroys the ulcer (or infiltration). Second, one need not be so careful as with the galvano-cautery in trying to hit a certain point which occasionally is difficult. Although I always direct the sparks towards the affected spot, I am well aware that they spread all over the larynx. Third, another advantage is the antiseptic effect of the ozone produced by the current. Fourth, the ease of administration makes it also preferable to other methods. Five, there is no danger of an edema of the larynx, as happens occasionally after the use of the galvano-cautery. A reaction sets in, but it is never of such a character as to produce dyspnea.

I have another case with tuberculous ulcerations in the larynx who improved remarkably quickly under fulguration, but he had to leave for the mountains on account of the heat in New York. He will return shortly, as he is desirous of getting again the fulguration treatment for his throat trouble. There is every chance that he, too, will be perfectly cured.

These cases are so satisfactory that I expect a great deal in future from the fulguration treatment and I feel I am justified in recommending it to my colleagues.

It was the writer's intention to speak in this connection of the surgical treatment of laryngeal tuberculosis, but as a paper with that title is to be read here to-day, I shall bring out whatever I have to say on that subject in the discussion.

Gentlemen, you have heard my first plea in regard to the establishment of throat clinics in every sanatorium for tuberculosis. My second appeal is to the directors of the sanatoria for the poor not to reject patients with laryngeal tuberculosis. It seems to be the irony of fate that we physicians should treat patients with incipient lesions who have no expectoration and even doubtful cases in the sanatoria for the poor, while those that are most dependent upon us and are the greatest burden and danger to their families should be rejected because the old idea still prevails that we can no longer help them, while in reality we could do a great deal for them. A unanimous decision by this Academy would go far towards improving the present conditions. Expensive sanatoria should not be built for incipient cases. But patients with laryngeal tuberculosis and those with advanced lesions need all the resources of modern medicine and all our skill and attention.

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EDITORIAL DEPARTMENT

THE DEAF

**Their Education—Improvement of Conditions—
Responsibilities and Porticipation of the Profession.**

EDITED BY

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The aim of this department of THE LARYNGOSCOPE will be to bring to the notice of its readers from month to month, facts that may be helpful to physician and patient in dealing with the life-problems involved in deafness. Suggestions from readers will be gladly received and all questions answered to the best of our ability.

The latest statistics of the work of teaching speech to the deaf in schools, as appearing in *The Volta Review*, February, 1912, show that of the 12,588 pupils in the 148 schools of the United States, November 10, 1911, 73.9 per cent were taught speech, and 64.5 per cent were taught wholly or chiefly by the oral method.

During the past eighteen years during which careful statistics have been collected, the per cent of speech-taught deaf has increased from 54 per cent to 73.9 per cent. The per cent of those taught by the oral method has risen from 24.7 per cent to 64.5 per cent.

But, as has been said before in this department, these figures are somewhat deceptive to "the man in the street," since he does not understand the difference in the *quality* of the output between those taught "by the oral method" in the so-called "combined" schools, and those taught by the oral method in the strictly oral environment of purely oral schools. It is not possible to obtain the best average results of oral training under the "combined" conditions where the pupils are permitted to lean upon the crutch of manual communication. Therefore the output of the "combined" schools is really a detriment to the spread of true oral instruction, since the average oral efficiency in the intercourse of daily life is much lower than that of the output from purely oral schools. Yet the

"man in the street" does not stop to inquire under what conditions the deaf pupil was taught who is presented to him as a product of oral methods.

Of the 8,119 pupils that the official statistics state were taught wholly or chiefly by the oral method, only 3,068, or 37.78 per cent were taught in the 84 oral schools of the United States. The other 5,051 are the output of the 64 "combined" schools. Of the 62 State Institutions for the deaf only 8 are oral and 54 are "combined" or "manual," and they are the principal source of the real "deaf-mute" and are the stronghold of manualism. On the other hand, the cause of oralism is being championed by 65 small day schools and 11 denominational and private schools, in addition to the 8 State Institutions.

It cannot be too strongly impressed upon the minds of the general public that the spread of true oralism is principally retarded by the existence of this large and constantly increasing number of pupils from the "combined" schools who go out into the world believing themselves, and believed by all who know them, to be the product of the oral method.

Progress depends upon intelligent public opinion. Public opinion is slowly created by observation and instruction. A large proportion of the pupils coming from "combined" schools are failures orally, and the public, being ignorant of the possibility of better educational conditions, base its opinion on these failures.

Sometimes a few intelligent and interested citizens undertake a propaganda of education and succeed in so enlightening the public that a demand is made upon the governmental authorities to better the conditions. Thereupon the wheels of progress begin to move. Such was the case in the State of Nebraska, in 1910 and 1911, and the ultimate results will be far-reaching, for they have *legislated* the manual methods out of the Nebraska State School.

But while legislation is a necessary preliminary, it must be followed by patient and intelligent public support and interest or the legislation cannot be executed.

Unfortunately, the State of Nebraska and its advisors have made a serious and fundamental error in their initial procedure that greatly endangers the ultimate success of their efforts. There is only one way by which a "combined" or a "manual" school can be changed to an oral school. That is by *absolute segregation* of the older pupils already in school who have begun under manual conditions, from the youngest and the newly entering pupils, and the

placing of these latter in a *wholly separate* and *purely* oral environment.

The path to success has been blazed, yes, made into a broad, easily followed highway by the State of Pennsylvania. Dr. A. L. E. Crouter, of the Pennsylvania Institution has, during the past twenty-five years, demonstrated in a practical and conservative manner the method by which the desired result can be attained, and it is the *only* method.

If the State of Nebraska had devoted even a comparatively insignificant sum to the renting of a small house at some distance from the existing institution, and had transferred to it the little children who had been in school but one year, and to them had added all the entering children, and had assigned to this little house the necessary matron and teachers to form a small, *purely oral* department, *wholly segregated* from the old institution, yet under the same head, they would have set their feet in the assured path leading to success. They failed to grasp this necessity the first year, but it is not too late and perhaps they will decide to do it the second year.

What the State of Nebraska has done, and can do in the future, every State in the Union can do. Sometime each one will do it, but who is going to bring up the rear of the procession?

Clinical Report on the Effects of "606" on the Middle Ear.

G. BARIL, *Rev. Hebd. de Laryngol. d'Otol. et de Rhinol.*, March 2, 1912.

The author describes a patient who had been tabetic for 15 years, and who gave a positive Wassermann reaction. He had suffered from head-noises and vertigo, the hearing gradually becoming so affected that a watch could not be heard.

This patient received four injections of salvarsan of 30, 40, 50, and 50 centigrammes respectively. The improvement was surprisingly rapid, the tinnitus and vertigo almost disappearing and the hearing improving. Baril believes that we have a valuable remedy in salvarsan, and that, if used with care and prudence, most of the complications attributed to its use may be avoided.

SCHEPPEGRELL.

SOCIETY PROCEEDINGS.
NEW YORK ACADEMY OF MEDICINE.

SECTION ON LARYNGOLOGY AND RHINOLOGY.

Regular Meeting, January 24, 1912.

JOHN F. MCCOY, M. D., CHAIRMAN.

Two Cases of Hairy Black Tongue. By W. W. CARTER, M. D.

(To be published in full in a subsequent issue of THE LARYNGOSCOPE.)

DISCUSSION.

DR. STRONG said that the tissue received for examination threw no light on the question of hyperkeratosis, as Dr. Carter had seen no reason for cutting deeply into the lesion.

Case 1. Bit of brownish gray tissue, 1.5 cm. long by 3 mm. wide, through which run numerous dark lines resembling hairs. This tissue consists of a network of fibrils which are readily teased apart. There is no epithelium or submucous tissue present. Stained by Loeffler, are seen numerous leptothrix filaments of varying length. These contain chromatin granules and have square ends. Many cocci present. On anaerobic culture, after 72°, the same beaded threads occur, also numerous fusiform bacilli and various streptococci and staphylococci. No spores. The fusiform bacillus grew aerobically after two sub-cultures. On wheat bread gelatin, at room temperature, no moulds.

Case 2. The same histological picture as in case 1, but with some epithelial detritus. No hyperkeratosis. The beaded leptothrix elements were present. No spores. Culture. Wheat-bread gelatin, after 48°, abundant growth of leptothrix at room temperature. No moulds.

The cultural and microscopic findings from these two cases do not support the view of Schmiegelow and of Sendziak that black tongue is due to *mucor niger*. They are consistent with the conclusions of Blegvad that no specific parasite has been demonstrated for hairy black tongue. Schmiegelow and Sendziak have claimed that the failure of other observers to use wheat-bread gelatin accounted for the failure to find *mucor niger*. This claim is controverted in these two cases. It is interesting to note here the presence of the fusiform bacillus commonly associated with foul conditions of the mouth. This apparently has not been noted before. Furthermore, an attempt was made to see if any spirochaete was associated with hairy black tongue. Anaerobic cultures failed to demonstrate any.

DR. HARMON SMITH regretted that the section had not seen the case when it first came under observation. In the examination he had been looking for something different, and thought that the man had been taking some sort of troches which has discolored the tongue. It was

characteristic, and occupied a space the size of the ball of the thumb in the median raphe. Dr. Arrowsmith had presented a case some years ago, and he had seen one other—both of which were quite similar to this one.

DR. ARROWSMITH said that the appearance of this case was almost identical with that of his own personal case toward its close, excepting that this was in the median line whereas in his case it was entirely off the median line. He experienced no sensation excepting that he thought he had caught a tooth-brush hair in his tongue, and on looking at it had found this condition.

DR. MCCOY said that he had seen a case of this kind about six or eight weeks previously at the University and Bellevue Clinic. The patient, a man, had come in, not complaining of this condition, but on having him show his tongue it presented this typical appearance, looking, as Dr. Smith had said, as though the man had been using some kind of troches which had discolored the tongue. It seems probable that this condition is more common than is generally supposed, and is not observed because the patients do not complain of it, as it does not bother them very much.

Case of Branchial Cyst. Presented by DR. L. M. HURD.

The patient, a young woman, presented herself at the Manhattan Eye, Ear, and Throat Hospital during the fall, with a sublingual lateral swelling, and on the left side of the tongue the sublingual gland was protruding prominently. She said that it had been troubling her only a few days, and there was no other symptom. Under the symphysis of the jaw was a slight bulging which she said had been there as long as she could remember. There did not seem to be anything the matter with the sublingual gland; a piece was excised and examined, and reported to be normal, but she wanted to get it out of her mouth. Accordingly, she was admitted to the hospital and under an anesthetic the gland was incised, and underneath it was the cyst, which was enucleated. The cyst ran back to the floor of the mouth and back to the angle of the jaw. Since removal it has shrunken to half its original size. It was on one side of the median line, and was attached to the genial tubercle of the jaw. There was no difficulty in removing it with the finger, and the wound healed promptly. That side of the tongue is pretty well bound down. There was no destruction of tissue on that side. The mucous membrane was dissected up before going into that side.

The case was presented as a branchial cyst, although in reality it was a dermoid cyst, probably due to congenital conditions—just before the fusion of the two mandibular arches, some of the epiderm became encapsulated, which later developed into a cyst. It had probably been there all her life. In the literature on this subject, it is suggested that these cysts may come from the lingual duct, but Dr. Hurd said that he had found nothing to support that theory, and did not think there was any relation with it. The strongest attachment in this case was to the inner side of the jaw. When cut in two, its contents were found to be greenish, sebaceous matter. It was undoubtedly a dermoid cyst, but being

situated in the first branchial arch it could be called a branchial cyst. The literature, however, refers to it as dermoid cyst of the floor of the mouth.

Case of Basal-cell Epithelioma of the Larynx Two Years After Operation. By L. M. HURD, M. D.

The patient, a man, applied to Dr. Hurd for treatment in November, 1909, with only one symptom, hoarseness. He stated that he had been hoarse for six months, but that for the past six weeks the hoarseness had been marked. Examination showed a white granular fibroid nodule on the left cord, about the size of a French pea; it was situated on the top of the cord, and was just large enough to go under the false cord, but one could not tell how far it went toward the ventricle. There was an area of hyperemia around the growth. There was no specific history. Von Pirquet was given, but it was two days before coming out positive. There was nothing in the history to indicate anything of a general nature. A specimen was removed, which clinically incorporated the entire growth. With a Krause cutting forceps, four or five millimetres in diameter, the entire white growth was picked out and submitted to Dr. Wright for examination. He reported it to be pure fibroma. The clinical findings seemed to be so much at variance with this report that the patient was taken to Dr. Wright for consultation. Dr. Hurd was very much in favor of removing the entire soft tissue on that side of the larynx, and with Dr. Wright's concurrence this was done the next day under local anesthesia, Semon's thyrotomy being performed. The anesthesia was hyoscin and morphin, and the rather new anesthetic, urea and quinin hydrochlorid. All of the left side of the larynx was removed down to the cartilage, the wound was closed, and the patient made a practically uneventful recovery.

After the operation, Dr. Wright examined the specimen, and rendered the following report: Surgeon, Dr. Hurd. Mr. A—, a man of 57, in perfect health, without significant antecedents; had been hoarse, not increasing very much nor very severely, for two months; no pain, though some tenderness could be elicited over the region of the left thyroid cartilage. From the intra-laryngeal growth, which had the appearance of malignancy, a fragment was removed of considerable size, directly over the greatest prominence, the whole protuberance being about the size of a large pea, just about the middle of the left cord. Microscopically examined, this was seen to consist wholly of newly-formed fibrous tissue in which there were a few racemose glands. Notwithstanding the negative findings of the microscope, complete excision by thyrotomy was performed, and tissue of the size of a bean including the growth at its center was removed. Sectioned and stained, a nest of atypical cells was seen at the center, with an area about the size of a French pea. The former mark of the forceps could be seen at one point, and it was quite apparent that none of the adventitious growth had been included in its grasp. The cells sprang from the basal layer of the epithelium and infiltrated to some extent the lymph spaces of the subjacent stroma, but in other places was sharply defined by a fibrous periphery from the loose or nor-

mal stroma. It was this periphery which had been encroached upon by the intra-laryngeal forceps. While it is impossible to say how far along the lymph spaces the epithelial cells had progressed, as the topography of the tissue was not completely discernible, the small size of the central area, the fact that the growth is of a type and is springing from a locality of the surface epithelium usually furnishing cancers of a low degree of malignancy, it is permissible to hope for a better prognosis than is usually warranted in such cases. Diagnosis: Basal-celled epithelioma.

Dr. Hurd said that there had been no change in the picture since the granulations healed up. The patient shows a lot of granulations which are the old granular surface covered with epithelium. He does not speak very well, for he does not try to use his full voice. The case seems to be one of those favorable ones which taken early in a favorable locality and treated by complete removal of everything to the cartilage presents a hopeful prognosis. It is now nearly two years and three months since the operation, with no indications of recurrence, and the patient is apparently in perfect health.

DISCUSSION.

Dr. COCKS asked how Dr. Hurd made the incision in the cyst case.

Dr. CARTER said that Dr. Hurd's second case was one of extreme interest, and that the result secured was remarkably fortunate. He had heard this matter of intrinsic carcinoma of the larynx discussed by some of the most prominent surgeons in the city, and a number of them think that in the course of the removal of an intrinsic growth there is considerable danger of infecting the area outside of the larynx, and that when the growth makes its reappearance it becomes extrinsic and beyond help of the surgeon. Dr. Hurd had probably operated on the growth at just the right time, when he could include it so thoroughly within his incision that none of the cells of the growth were exposed to the wound outside of the larynx.

Dr. FREUDENTHAL said that there were very few cases reported in literature which had lasted for many years after such an operation. The first one that he could recall was reported by B. Fraenkel many years ago, in which instance the patient lived eleven to twelve years after the operation. He believed that Dr. Gleitsmann had reported a case which lasted for some years.

Dr. MCCOY congratulated Dr. Hurd on the excellent result obtained in the cancer case, and asked about the anesthesia—whether the urea and quinin was infiltrated in the tissue externally or in the larynx itself.

Dr. HURD, replying to Dr. McCoy, said both was done.

Dr. LEDERMAN said that Dr. Gleitsmann's case, to which Dr. Freudenthal had referred, had been reported under the title of "Endothelioma of the Larynx." He thought that the patient had been seen some time later by Dr. Harmon Smith, who reported further invasion of the malignant forces. Microscopically, the growth was grayish-white in appearance.

Dr. HURD, replying to Dr. Cock's inquiry about the dermoid cyst, said that he had made an incision one and a half inches long, at the side of the tongue. The patient had been very resistant to the anesthesia; he had first had 1/100-1/8 hyoscin and morphin; he was given a second and a third dose before he began to feel it, and when he came to the operating room he expected a general anesthetic, so he was given a few drops of chloroform. Ethyl chlorid was used to freeze the skin, and the incision was made; then a one per cent solution of urea and quinin was used and the tissue infiltrated outside the thyroid, and everything separated down to the thyroid cartilage. Then the needle was run through the thyro-cricoid tissue, and the interior of the larynx was infiltrated in the same way. The inside of the larynx was anesthetized before splitting the thyroid, which was bony and took some time. Some delay was caused by cutting the superior laryngeal artery and checking the hemorrhage. The patient was talking and telling stories all the time of the operation, and did not seem to mind what was going on.

The point in the case which had occasioned him most worry was the difference between the clinical and the microscopic findings at the first examination. He had been sure that he had incorporated the whole growth in removing the specimen, yet the appearance was so typical of malignancy that he could not accept the first laboratory finding.

Scleroma of the Larynx. Presented by P. F. SONDERN, M. D.

The patient had come to the hospital complaining solely of hoarseness, which she claimed was of ten years' duration. She was 35 years of age, and had left Russia six years before, coming from the Province of Mintz from whence they had had several other cases of the same kind at the hospital. There was a subglottic thickening of the cord and also a thickening in the left nares and a thickening of the mucous membrane. A section of the subglottic growth revealed nothing under the microscope. Two blood cultures were taken, and also a specimen of the nasal growth, all of which showed the Frisch bacillus.

DISCUSSION.

Dr. EMIL MAYER said that there were some points of great interest attaching to this case, and he hoped that Dr. Sondern would see to it that it was properly put on record, for it was important to know how many of these cases are coming to the United States. They all seem to come from a small territory in Poland in the neighborhood of Mintz. Apparently, thus far, no case has been reported as originating in any person born in the United States. It would be a matter of great interest to know how this infection occurred—whether any of her family had had a similar condition, whether the patient had been treated in Russia, and whether it had been recognized there. It was most important to have full records of these cases, for some day the question will arise as to the probable contagiousness of scleroma of the nose and larynx in connection with the admission of immigrants from that section. Sporadic cases have appeared in the countries adjacent to Poland, and from a sanitary point of view he hoped that Dr. Sondern would make every effort to get a full history of this case, its origin, and possible inheritance.

Another question was what shall be done for these cases. So far, constant dilatation seemed to be followed by the best and most lasting results. One case which he has presented before the section comes to his clinic once a month to have the bronchoscopic tube passed through the opening past the scleromatous part, and that seems to be sufficient, for in spite of its name it was not hard tissue, and it is possible to dilate the parts and relieve the patients. Many of the members had seen cases of this kind in Europe going around with their tracheotomy tubes. The method of treatment outlined is far better and more advanced, and more satisfactory for the patient.

Dr. Mayer further said that he had that very day seen two cases in which he had made a clinical diagnosis of scleroma. One of the patients had been wearing a tracheotomy tube for five years, and was readmitted to the hospital suffering from apnea. He died suddenly, in the hospital and, very unfortunately, an autopsy was not permitted.

Dr. HARMON SMITH said that these cases seemed to be coming under observation more frequently than formerly, due either to an increase in their frequency or to better methods of diagnosis. Last year he had presented three cases to the Section on Dermatology, which had occasioned surprise on the part of the Chairman, who rather doubted the correctness of the diagnosis. However, during that year there had been five cases under observation in his own and Dr. Wright's clinics. While there may appear to be some reasonable apprehension relative to the infectiousness of scleroma, based upon family tradition and local existence, yet the etiology of the disease and its non-communicability to those living in different countries seemed to be an argument against transmission. Although the lesion is due to the presence of the Frisch bacillus and with this is found the Russell body and the foam cell, yet it seems that some condition of soil, climate, or environment predisposes to the propagation of the elements characterizing the lesion.

As regards the therapeutic measures in the care of these cases—the X-ray has never failed to eradicate the lesion when it involved the ala or any part of the skin, but this measure had failed in many instances when the lesion was upon the mucous membrane. Dr. Guentzer had employed the vaccines of the scleroma, in which cases he had injected 1 ccm. of autogenous vaccine containing 250,000,000 dead bacteria, and this had been repeated at infrequent intervals, with the result that in two or more cases the lesion had been held in abeyance. Unquestionably the X-ray in conjunction with the vaccine had held these cases in check for two years.

Dr. GUENTZER said that two years ago he had reported very fully on two cases. In going over the literature at that time, he found that the treatment which was most approved was the X-ray. That had been tried out at the Manhattan Eye, Ear, and Throat Hospital with variable success, and with little success when it pertained to the deeper lesions. In one of the cases with cutaneous lesion which he had presented, it healed up very nicely, but the deeper nasal and pharyngeal lesions were not touched by the X-ray.

As the bacillus is very easily isolated, he thought it might be a good condition to treat with a vaccine, and so tried it; and while he was not

prepared to state that the patient had been cured, yet the disease had made no advance while under treatment. He had not seen the woman since the summer, but one young man so treated has been out West and in Canada, and has been working on the farm in active out-of-door life, and the disease has not made a step in advance. The young man breathes well and feels well.

Sporadic cases have not been found in the United States, but in Egypt and Central America cases were reported where the patients had never left the country. In Dr. Sondern's case, while the little speck of tissue showed no scleroma histologically, that is not a proof. More of the tissue must be examined, or it might be claimed that the patient has scleroma of the larynx since she has scleroma of the nose. He hoped that Dr. Sondern would try to make a positive diagnosis. Dr. Mayer had seen many of these cases, and while he himself had seen many that looked like scleroma he would not be sure of a case unless a microscopic examination were made and the bacilli found in the tissue along with the other pathologic changes, the hyalin bodies and foam cells.

DR. EMIL MAYER said that he would be willing to accept the diagnosis of scleroma of the trachea where he found as much thickening as in this case, provided the nasal tissue showed it to be scleroma. He thought the deeper tissues would also show it on examination. So far as he knew, no single case had been reported as originating in a person born in the United States. Professor Gerber, a well-known authority, has made an exhaustive study of scleroma, and has undoubtedly traced it directly to contagion. Von Schroetter in Vienna, and others, all feel that it is contagious. It should not be lightly passed over on account of the few cases seen. It seems quite likely, as Dr. Smith has said, that we have probably overlooked a good many cases, yet in making a round-up of all the cases reported in America he had at one time found only sixteen cases recorded in the literature of the United States—one of the first having been shown by Dr. Freudenthal.

DR. SMITH said that one of the members of the Section on Dermatology had told him of a physician in Buffalo, who had reported a case of rhino-scleroma in an American born.

DR. EMIL MAYER said that that was done before the days of the bacillus and was not substantiated by pathological examination. It was a case of Dr. Wende's, but we could not to-day accept this single isolated case as being a true one, for it was not substantiated as we substantiate them to-day. The case was mentioned in the speaker's paper on "Scleroma in the United States," and not accepted as a genuine case.

Result After Operation for Aneurysm of the Carotid Artery. By T. J. HARRIS, M. D.

DR. HARRIS said that he had asked Dr. Samuel Lloyd to speak about the operation, but that he would like to say a few words first. He had presented this case before the section three or four months previously. The child had been brought to the Manhattan Eye, Ear, and Throat Hospital with a swelling on the right side of the neck, and a very superficial examination revealed an aneurysm. The history was very clear. The little fellow was sleeping on a fire escape on July 4, when something

struck him in the neck. His mother was called, and found the child unconscious. He was immediately taken to the hospital, and was under observation for some time. According to Dr. Harris' recollection, Dr. Dougherty had seen the case while the child was in the City Hospital. When seen at the Manhattan Eye, Ear, and Throat Hospital the case presented the condition shown in the X-ray pictures. At that time, the diagnosis was traumatic aneurysm due to the presence of a bullet from a sky-rocket, which had entered the neck. Dr. Law had made some very excellent pictures. Dr. Lloyd also had had some very beautiful pictures made of the neck, showing the condition before operation. Those who were present when the case was first shown before the section discussed the possibilities of operation and some one had suggested a new treatment reported from California, and much apprehension had been expressed regarding the removal of the sac.

Directly after the case had been presented, Dr. Lloyd had been asked to see the patient, and he regarded the case as operable. Dr. Harris said that he had seen Dr. Lloyd perform the operation, and that it was about as delicate and difficult a piece of work as he had ever witnessed. The result was wonderful.

DISCUSSION.

DR. LLOYD expressed his pleasure at having the opportunity of speaking of this case. When he first saw the patient with Dr. Harris, the boy was not quite ready to come to the hospital, and a week or ten days elapsed before he could be admitted. During that time the growth increased to nearly double the size it had been when he first saw it. There was no doubt about its being a dissecting aneurysm of the common carotid, and it was increasing very rapidly. The X-ray showed the location of the bullet. The boy still has it, as no attempt was made to get it. It is lying between the transverse processes of the seventh cervical and the first dorsal vertebrae; one of them is considerably crushed. At the time of operation, he cut down rapidly on the sac and then found that it was impossible to approach the lower portion of the carotid on account of the extremely thin sac and its overlying the artery, so he was obliged to dissect out the subclavian and follow that vessel, and lift the sheath of the aneurysm up from over the edge of the clavicle, and then work up over the common carotid until a ligature could be passed around it. This was extremely difficult, for it was a dissecting aneurysm, the sac was an adventitious one, and threatened to rupture every moment. Finally the jugular was tied, and then the jugular was dissected from the posterior portion of the sac and worked free from the anterior surface; the pneumo-gastric was then dissected away from the sac. The aneurysm was then separated up to the point of bifurcation, of the common carotid, when it ruptured. This was anticipated, and the assistants had been warned to be ready for hemorrhage from the other end. Pressure was made at once and the dissection completed to the point where it was possible to ligate the external and the internal carotid. It was a pity that it ruptured, for now it is so contracted that it looks like a very small affair, but the photograph shows the condition at the time of operation and to some extent indicates the difficulties and

peculiarities of the case. There was no change in the boy's pulse at the ligation of the common carotid, and no indication that the circulation had been shut off on that side. Everything went on as before, there was no interference with respiration during the considerable manipulation of the pneumogastric. It was all done with the knife, pains being taken not to produce any trauma of the nerve or vessel. Recovery was prompt and without any disagreeable symptoms.

DR. MAYER said he thought both Dr. Lloyd and Dr. Harris would agree that those who spoke at the first presentation of the case about the manipulations of the San Francisco surgeon as being worthy of consideration were quite within their rights when the extreme difficulty and delicacy of the operation which Dr. Lloyd had so successfully and triumphantly performed was considered. Every one realized that the case presented a most unusual condition—a dissecting aneurysm on one of the most important arteries of the body, and the operation would not have been successful unless in the hands of a very skilled surgeon. Dr. Lloyd was certainly to be congratulated on the brilliant result achieved.

DR. CARTER asked Dr. Lloyd if the collateral circulation was usually established in this almost spontaneous manner after ligation of the common carotid, or whether in this case it was due to the patient's age.

DR. DOUGHERTY said that an important point was the rapid growth of the enlargement of the aneurysmal sac. He had not seen the case while in the City Hospital, for it was in the general surgical division. He had, however, seen the X-ray plates in the hospital, and they showed a very minute deformity as compared with what Dr. Harris showed and with the condition shown in Dr. Lloyd's photographs. The surgeon in charge said that at first he thought it was a minute aneurysm, and the radiographer thought the same thing. At the hospital they thought it had been caused by a pistol bullet, and not by a sky-rocket.

DR. FRANCIS QUINLAN asked what connection this case had with the intrinsic conditions of the larynx. It seemed to him to belong to the realm of general surgery rather than to the laryngologist. He had not heard any remarks made by the members in regard to the impaired functions of the larynx or its condition as affected by this bullet.

DR. LLOYD, replying to Dr. Mayer's question in regard to treating the aneurysm other than by operation, said that it would have been utterly impossible in a case of this sort. He regretted very much that the specimen presented had so contracted that one could not see the opening in the upper part of the common carotid, but a distinct piece was taken out, so that it was not a true aneurysmal sac, but an adventitious one, and any of the procedures which had been suggested would have failed. There was a constant leakage, which was producing the rapid increase in the size of the aneurysm.

The only other thing was the plastic operation on the common carotid, but as soon as he realized the thinness of the sheath and the difficulties before him, and as soon as his fingers felt the indurated tissue around the opening, he was convinced that nothing short of ligation would save the boy's life. He would soon have had an immense aneurysm, with final rupture and death by hemorrhage.

Replying to Dr. Carter's question about the spontaneous establishment of the collateral circulation: this was often the case where there had been a good deal of leakage, but where the circulation was going on from the other side. He could not say much about it in practical experience, for he had not often ligated the common carotid. In experimental work, however, when he had been teaching surgery on the cadaver, he had fitted up an artificial heart to illustrate the pulsation, and it was quite common to find a bleeding through the external and internal carotid after the common carotid had been ligated. That was to be expected in a case of this sort. Not long since, in St. Francis' Hospital, he had had a tremendous cirrroid aneurysm, one of those Medusa heads such as are often mentioned in literature. This was the only one he had ever seen, and it was quite interesting to see how the circulation was carried on from the other side after the ligation of the common carotid on the affected side.

General Bacteriemia Following a Nasal Operation. By SEYMOUR OPPENHEIMER, M. D.

Patient, aged 18 years, was admitted to Medical Service Mt. Sinai Hospital, September 25. Three weeks previous following sea bathing, there was a purulent discharge from left ear. Two days prior to admission, a submucous resection of the nasal septum had been performed, which had been followed by a series of chills, temperature, vomiting, and severe frontal headache. Examination of nose showed some purulent secretion. Patient looked very ill and apathetic. W. B. C. 17,800, Poly. 81%. Temp. 103°, which rose on the following day to 106° preceded by a chill. Prostration more marked, some rigidity of the neck and a slight Kernig was present. Ocular examination showed tortuous retinal vessels but no distinct choking of discs. Blood-culture showed a bacteriemia.

At this time (September 28) I was asked to see the patient and found the remains of an acute suppurative process of the middle ear, which had almost subsided. The vestibular function was normal and I expressed the opinion that while it was possible that the evidences of meningeal irritation might be the result of the previous otitic inflammation, yet it was more likely to be the result of the intra-nasal inflammatory process. There was no evidence of any mastoidal involvement. I advised lumbar puncture which being practiced showed clear fluid apparently not under increased tension. In view of the positive blood culture, and the inactive nature of the aural process, it was considered that we were dealing with a thrombotic condition of the cranio-nasal sinuses as the result of the nasal infection.

September 29. A moderate swelling of the antero-inferior portion of the auditory canal is present. No ante-tragal, mastoidal or jugular tenderness. Patient more septic and some swelling and tenderness present over sacrococcygeal joint.

September 30. There being no development of any symptoms suggestive of a thrombotic condition of the sinuses adjoining the nose I expressed the opinion that exploratory exposure of the sigmoid sinus to be justifiable in view of the increasing bacteriemia and the history of the aural suppuration ante-dating the nasal operation. This was done

but the wall of the exposed portion of the sinus appearing so normal, the sinus was not opened. During the following week septic condition was very manifest. Temperature range very considerably. Also evidences of a meningitic inflammation affecting the areas governing the right upper extremity. Blood cultures still positive. An autogenous streptococcal vaccine was prepared at the suggestion of Dr. Alfred Mayer and was administered from this time on at three day intervals. Whether these injections had any influence on the course of the disease I am, of course, unable to state with any degree of certainty, but my impression is that it had a distinctly modifying influence.

From October 7 to November 7 the temperatures fluctuated considerably, each rise being co-incident with local swelling over the elbow, groin or other distant parts indicating metastatic processes of the series of blood cultures, one culture taken at a period when the temperatures had been low for a few days was negative, but became positive again, co-incident with the redevelopment of severe clinical signs of a general septicemia.

The point of great importance which this case demonstrates is the fact that while in otitic disease, a positive blood-culture indicating a general bacteriemia is indicative of an infection arising only via the venous channels (thrombosis), in the nose it seems quite possible to have a bacteriemia occurring through infection via the lymphatics, without any thrombotic process.

DISCUSSION.

DR. HAYS said that two years ago he had reported two cases of septicemia following submucous resection. At that time no other cases had been reported in the literature, and it created quite some comment. It was said that the nose and throat men did not report these cases, and that if less work of this kind was done it would be done more cautiously. Since then he has seen quite a number of these reports, and it would seem to be quite possible to get a general septicemia as a complication in submucous cases. In the two cases he reported it was almost impossible to find any focus of infection. Unfortunately, the first girl died in four days of general septicemia. In the second case, after a great deal of manipulation, he found a pocket of pus between the flaps of the submucous wound, almost at the cribriform plate. The girl recovered in two days. That is a lesson worth remembering. If one has a case where he feels there is no other cause, the only thing to do is to put the patient under an anesthetic and explore until the focus is found. In all probability a thrombosis takes place in some very small veins and they are being constantly fed, though the thrombosis does not seem to progress as in the larger veins. He had heard of this case of Dr. Oppenheimer's at the time and could not help being pleased that other men were getting this condition as well as himself.

To be continued.

BOOK REVIEWS.

It is interesting to note the progress and evolution of oto-laryngology even from the standpoint of the more substantial literature which has been published in this field. Less than a decade ago the publication of work in this specialty was confined largely to treatises, text-books and manuals on diseases of the ear, nose, and throat, and the substance of these volumes was more or less stereotyped in character.

To-day this field has broadened to such an extent that voluminous treatises are being published on special subdivisions of this specialty, so that we have exhaustive monographs before us on: "The Surgery of Deformities of the Face," by John R. Roberts; "Oral Diseases and Malformations," by Geo. V. I. Brown; "The Developmental Pathology of the Palate, Nose and Maxilla," by Eugene S. Talbot; "Skiagraphy of the Accessory Nasal Sinuses," by A. Logan Turner; "Plastic and Cosmetic Surgery of the Head," by F. S. Kolle, and similar publications recently issued, all of which indicate the unusual activity, and rapidly expanding character of otology in its practical, technical and pathological phases. M. A. G.

Plastic and Cosmetic Surgery. By FREDERICK STRANGE KOLLE, M. D., Fellow of the New York Academy of Medicine, Member of the Deutsche Medizinische Gesellschaft, N. Y., etc. Pp. 511, with 1 colored plate and 522 illustrations in the text. D. Appleton and Co., New York, 1911. Price, cloth, \$5.00.

The oto-laryngologist is called upon from time to time to develop his resources and originality by plastic and cosmetic surgery in the conduct of his more extensive operative cases, and in the correction of such defects as may come under his observation. Our readers will, therefore, welcome the presentation of this excellent work on "Plastic and Cosmetic Surgery" by an American colleague who has had many years of valuable experience in this special technic.

The author presents a practical and concise treatise on plastic and cosmetic surgery. The importance of this branch of surgery is well recognized, yet literature on this subject is widely scattered and scanty, and consists mostly of small, detached papers or reports, with occasional references in text-books on general surgery.

There is no doubt of the actual need of authoritative works on this subject, and this book should be especially serviceable and valuable to those of our colleagues in oto-laryngology who are practicing in our specialty in its wider scope and who include cosmetic and plastic surgery actively in their practice.

The author devotes considerable space to an historical review of plastic and cosmetic surgery, and to the special requirements during operation, the equipment for operation, the selection and use of proper antiseptics, the importance of careful wound-dressings, and the principles of plastic surgery.

In the chapter on oto-plasty are considered: the restoration of the auricle; auricular protheses; coloboma; malformation of the lobule; enlargement of the lobule; attachment of the lobe; malformations of the auricle; microtia; auricular appendages; polyotia; malposition of the auricle.

The following chapter on chello-plasty, or hare-lip surgery includes: classification of hare-lip deformities; the operative correction of hare-lip; unilateral labial cleft, congenital bilateral labial cleft; post-operative treatment of hare-lip; superior chello-plasty; classifications of deformities

of the upper lip; operative correction of deformities of the upper lip; inferior cheilo-plasty; labial deficiency; labial ectropion; vermillion deficiency.

One of the most valuable chapters in this treatise is that on subcutaneous hydrocarbon prostheses; its indications, precautions, selection of proper method, untoward results, paraffin injections; proper instrumentation; practical technic; and a consideration of the many minute details prompted by long experience in this field.

In the chapter on rhino-plasty, the various types of operation are exhaustively described, and the technical details are presented in a thoroughly comprehensive form. A second chapter on rhino-plasty is devoted to cosmetic surgery. It includes the correction of the various types of external nasal deformities which have been so extensively treated at the hands of quacks, beauty doctors, etc., and offers this subject in dignified form for the consideration of the nasal surgeon.

The concluding chapter includes methods of producing careful photographs, and of making plaster-casts for the careful study of individual cases before and after operation.

It is a splendid work, and should stimulate our oto-laryngological surgeons to widen their field of usefulness by including plastic and cosmetic surgery in their regular practice.

Surgery of Deformities of the Face, Including Cleft Palate. By JOHN B. ROBERTS, A. M., M. D., Professor of Surgery in the Philadelphia Polyclinic, Surgeon to the Methodist Hospital, formerly Assistant Eye and Ear Surgeon to the Children's Hospital and Demonstrator of Anatomy in the Philadelphia Dental College. Pp. 273; illustrated with 273 figures. New York: Wm. Wood & Co., 1912. Price, \$3.00, net.

The appointment to deliver the Muetter Lectures of the College of Physicians of Philadelphia for 1900 induced the author to give special attention to the operative correction of facial defects. This lectureship was established by Thomas D. Muetter of Philadelphia, who played such an important part in the early history of plastic surgery.

The individuality and character of the work is well-expressed in a short quotation from the author's preface: "Further study has shown me an everwidening field for this department of surgical endeavor, and has given rise to a consequent surprise that so many sorely afflicted persons fail to realize the present possibilities of relief. Nature seems willing to aid the operator's efforts in an astonishing degree, if he use skill and exercise patience in showing her the way to exert her reparative forces."

The opening chapter reviews the development of rhino-plastic and cheilo-plastic surgery from 1597 to the present period. This is followed by a survey of the anatomy of the face, in which surgical landmarks and others of practical value are given prominence. Here also is included descriptions of the various facial types from infancy to old age, and variations in racial characteristics.

In the chapters on the characteristics and principles of surgery of the face, the individual work of the author in this special field of surgery is well-recognized. The sound advice and fixed rules herein set forth, together with the variations in the surgical technic from that commonly employed in general surgery indicate ripe experience and careful work.

There are chapters on injury-dislocations, malformations, skin diseases requiring surgical treatment. Hare-lip, facial clefts and cleft-palate are well described in three valuable, practical chapters, and this special work is profusely illustrated by original drawings and photographs.

Deformities of the external ear are given briefer consideration than the importance of this special plastic surgery would indicate. The chapter on external deformities of the nose is considered only too briefly for the interested rhinologic surgeon, but includes a very good resumé of the various operations suggested in rhino-plasty.

It is a practical volume from cover to cover and should be eagerly read by every progressive nose and throat surgeon.

Developmental Pathology. A Study in Degenerative Evolution. By EUGENE S. TALBOT, M. D., D. D. S., M. D., LL. D. Pp. XVIII-435 with 346 illustrations. Price \$6.00 net. Richard G. Badger, Boston, 1911.

In a classic monograph of 440 pages, the author endeavors to show that man in his growth, his structure and organs, is but a modification and recapitulation of the development of the species.

Furthermore, that in the early study of the embryo, a disturbance in the nervous system, a check by parental defect, eruptive fever, or other agencies during the crucial period of development affects both the individual and the species.

The practical purpose of this volume, therefore, is to correct current, erroneous conceptions of heredity, by showing that neither excessive nor arrested development is inherited directly from the parent. A child born with structures and organs which indicate a departure from the normal type is said to inherit these defects. Upon investigation, however, no defect can be found in the family for generations. In the apparently inability of heredity to account for these departures from the type, the ordinary mind fails to understand them. The true key of the situation lies in the fact that human heredity cannot be considered to any purpose without a consideration of intra-uterine education, environment and development.

The author does not claim to present a complete and exhaustive analysis of the pathological conditions of all the structures and organs which should be included in a consideration of this problem, but simply desires to lay down general principles for guidance in further research along these lines.

We know Dr. Talbot to have been a close student, for many years, of the field here discussed, and we have followed with much interest his original deductions in the study of dental arches, the maxillary sinuses, cleft palate and hare-lip; and the vault of the pharynx as presented in occasional papers in the past years.

The present monograph is no doubt crystalized from many years of labor and study, and is presented at a most opportune time—a time when studies in degenerative evolution seem to fit in almost chronologically with the advance made in embryology and developmental pathology.

The Surgery of Oral Diseases and Malformations; Their Diagnosis and Treatment. By GEORGE V. I. BROWN, D. D. S., M. D. Oral Surgeon to St. Mary's Hospital and to the Children's Free Hospital, Milwaukee; Professor of Oral Surgery, Southern Dental College, Atlanta, Ga. Octavo. 740 pages, with 359 engravings and 21 plates. Cloth, \$6.00, net.

The oto-laryngologist who is ambitious to help in broadening the scope of our specialty must of necessity include a large part of oral diseases, their malformations and corrections, in his active work.

The most important chapters in this field, that should engage the thought and critical attention of oto-laryngologists are: deformities of the nose in their relation to defects of the upper maxilla and palate; the large question of hare-lip and cleft-palate, their operative correction and their influence on defects of speech; the diseases and pathology of the maxillary sinus in its relation to the superior maxilla and oral cavity. Diseases, tumors, and malformations of the tongue and other important questions are considered in this exhaustive treatise by Dr. Brown.

In the literature and practice of this specialty of oral surgery, Dr. Brown has received a well-earned recognition for his excellent and original work and for his good plastic and surgical results.

The chapters on hare-lip and cleft-palate are exhaustively treated, and it is here especially that Dr. Brown proves his claim as an authority in this difficult department of surgical technic. In the chapter which he devotes to a consideration of cleft-palate and hare-lip, he has injected much of his personality and originality, making it, in our opinion, the feature of this volume.

Another feature worthy of emphasis and special comment is the large number of well-executed, original illustrations to elaborate the text.

If we were to consider this treatise exclusively as one on oral diseases and their proper disposition, we should perhaps wonder why the field of oral surgery had extended in its many ramifications to a consideration of the surgery of the facial nerve, carcinoma of the neck, the surgery and pathology of the sphenoid and frontal sinuses, lesions of the auditory nerve, diseases of the brain and other subdivisions and classifications which in our opinion the author could not properly classify under "oral diseases and their disposition."

From the broader point of view, however, we are always glad to encourage the extension of a specialty rather than its contraction, and just as we feel the importance and necessity of extending the usefulness and scope of oto-laryngology, so, too, oral surgery should be allowed every latitude to stimulate our co-workers.

Oral Surgery; A Text-book on General Surgery and Medicine As Applied to Dentistry. By STEWART LEROY MCCURDY, Professor of Anatomy and Oral Surgery, School of Dentistry, University of Pittsburg, etc. Pp. XXII-469, with 228 illustrations in the text. D. Appleton and Company, New York, 1912. Price, \$3.00.

As the author emphasizes in the preface, oral surgery is a well-defined and separate specialty. He seems inclined towards classifying surgery as a department of dentistry rather than as a subdivision of surgery. As a specialty in surgery we contend that it is as much a part of the dominion of the nose and throat surgeon as of that of the dentist or of the general surgeon. The nose and throat surgeon has been largely responsible for nearly all of the progress that has been made in the past decade in the development of the surgical technic of the faucial tonsils, defects and malformations of the hard and soft palate, tuberculosis and other specific processes in the oral cavities, the radical treatment of the maxillary antrum, fractures of the nose, etc., and therefore laryngology may claim a just and legitimate share of this new department of surgery.

The author of this volume states that "the aim has been to eliminate everything that cannot be directly associated with the practice of dentistry or be of special interest to the dental student and practitioner." If this claim can be justified, then dentistry is surely a rapidly developing and far-reaching field.

We are thoroughly in accord with the expressed view that the dental surgeon should be familiar with much of the oral work presented in this book, but it is our opinion that this information should be rather with a view to enabling him to properly diagnose the large varieties of lesions in the oral cavities, to intelligently advise patients as to the further disposition of the case, and to co-operate actively with the laryngologist and special surgeon who is especially qualified and prepared to dispose of these cases.

This volume might be considered as an extensive compend or brief manual on oral surgery rather than as an exhaustive treatise or comprehensive text-book. It contains much valuable data in concise form and many original illustrations.

The half-tones of the X-ray plates illustrating the value of this important accessory to oral surgery might be clearer and better presented. The text and book-work is got up with the usual care and elegance characteristic of Appleton and Company.

